Humanistic Perspectives in a Technological World

Georgia Tech
School of Literature, Media and Communication
Ivan Allen College of Liberal Arts

Humanistic Perspectives in a Technological World

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Acknowledgements

This volume, a veritable narrative tour through the School of Literature, Media, and Communication (LMC), is first and foremost a communal effort by all the faculty who decided to contribute essays on how they provide humanistic perspectives in a technological world in their research, teaching, and service activities. We are grateful for their giving freely of their valuable time to write these essays. We would also like to acknowledge the support from Ivan Allen College of Liberal Arts Dean, Dr. Kaye Husbands Fealing, who recognized the value added to our School and the College by this project. Throughout the book you will find statements from numerous faculty, staff, and administrators from all across Georgia Tech about the role our School plays in the larger context of our entire institution. We are grateful to them for adding their "external" perspective and appreciation to our volume. Most importantly, we would like to acknowledge our assistant editor, Travis Denton, Associate Director of Poetry@Tech, who applied his amazing editorial and design skills to creating the final "look" of our volume. Travis is also responsible for our finding a suitable publisher capable of realizing our demanding ideas about the format and quality of paper, color, and cover. For the cover art, we are indebted to our distinguished alumna, Dr. Nettrice Gaskins, who beautifully combines the arts and technology in her work. Finally, we would like to thank all who contributed photographs, design advice, and other helpful hints throughout the process. We hope everyone who receives this book will enjoy reading and sharing it with those who are looking for excitingly interdisciplinary humanities programs at one of the country's premier technological universities.

Richard Utz & Karen Head, editors

Humanistic Perspectives in a Technological World

“The human desire to explain our existence through story is nearly as old as humanity itself. Through storytelling in all its myriad forms, we can reflect on who we are and our influence on the world and strive to become more tomorrow than we are today. In the School of Literature, Media, and Communication (LMC), this age-old tradition has been brought fully into the modern world. An education in LMC helps us understand the literature and media of yesterday as well as shape what media and literature will look like tomorrow. In these pages, you will gain insight into how the study of literature sharpens and opens minds – critical skills for the liberal arts major and the engineer or computer scientist alike. You will read about the rigorous, analytical, and impactful work LMC’s students and faculty perform in literary and cultural studies; in understanding the relationship between

science and technology and cultural practices; in performance and communications studies; digital media; computational media; science fiction; film and video production; Black media studies; and more. You also will learn about their remarkable record attracting external funding for projects exploring the interplay of the humanities and technology. LMC equips tomorrow's leaders with the technical and humanities skills necessary to define the future of literature, media, and communication in an increasingly technological world. Through the ethos of "making with meaning," LMC's work helps all of us better understand how we shape and are shaped by today's pervasive technology. It is work that makes a profound difference for our students, our college, Georgia Tech, and the world."

Kaye Husbands Fealing, Dean
Ivan Allen College of Liberal Arts

“The role that LMC plays in the humanistic side of what our students take away from their Tech experience is more important than ever.”

Steven W. McLaughlin,
Provost and Executive Vice President
for Academic Affairs

Richard Utz, Chair & Karen Head, Associate Chair

Literature, Media, and Communication

Come Join Us in the Cloud

The School of Literature, Media, and Communication (LMC) is quite unlike most traditional teaching units in the liberal arts and humanities. Most importantly, it is not organized according to the regular confines of academic disciplines that have dominated how groups of scholars and teachers define and congregate since the late nineteenth century. Thus, while "English" was among the six foundational departments when Georgia Tech was founded in 1888, faculty in our English Department recognized the signs of the times in the 1990s and reoriented and renamed the unit to critically accompany and shape the ever-evolving future of academic education. The result of this reorientation, and the realization that complex social questions cannot be solved by any one academic discipline in isolation, is a School that features faculty with specializations in Biomedicine, Communication, Composition, Creative Writing, Critical Race Studies, Cultural Studies, Digital Media, Digital Humanities, Film, Literature, Performance Studies, Science Fiction, Video, and many more. All that still suggests the "English" origins of our unit are the curricular offerings of ENGL 1101 and ENGL 1102, a course sequence which satisfies the Georgia Board of Regents requirement for composition. However, even these courses, just like LMC's organizational and curricular make-up, bear only a faint resemblance to conventional academic introductions to writing and communication. They offer elements of the kinds of Written, Oral, Visual, Electronic, and Nonverbal (WOVEN) communication with which students are expected to be conversant now and in the future. Multimodal or multiliteracy competencies are the foundation for successful communication, and it is especially important for communication about science and technology. The Naugle CommLab, which is housed in Georgia Tech's Clough Learning Commons, was designed to support multimodality/multiliteracy as part of a campus-wide commitment to the communication needs across the disciplines, and it is one of the few communication centers in the country to have a center explicitly built as a research lab. While there is little need for remedial support at

Georgia Tech, we create an environment in which students learn to analyze discourse situations, evaluate available tools, and make critically-informed decisions about how best to employ various communication approaches to meet their rhetorical goals.

Similarly, our two Bachelor of Science degrees are deeply interdisciplinary and encourage students to be "critical makers" interested in both evaluating AND producing the media (texts, images, games, video, objects, etc.) with which they engage. Our Literature, Media, and Communication (LMC) major allows students to focus on one of six threads from an exciting interdisciplinary banquet of courses: Communication; Literature; Media; Social Justice Studies; Interaction Design; and Science, Technology, and Culture. Our Computational Media (CM) major, which we offer in collaboration with the College of Computing, allows students to select one thread from LMC and one from Computer Science to forge a similarly interconnected experience. CM students may concentrate on Intelligence and Film, Performance, and Media, People and Game Studies, Media and Interaction Design and Experimental Media, to name only a few. At the graduate level, we provide nationally renowned M.S. and Ph.D. programs in Digital Media which comprise the areas of Arts & Entertainment, Civic Media, and Creativity & Knowledge. In 2018, we added the M.S. in Global Media and Cultures, which brings together faculty expertise in the School of Modern Languages, the Library, and LMC. This degree is geared toward professional careers that require a theoretical grounding in media and cultural studies, advanced training in a critical global language, and hands-on cross-cultural experience through study abroad, internships, a bilingual portfolio, and creative projects.

From a distance, LMC resembles somewhat the description you will see if you search for our School acronym on *Wikipedia*. There, you will find that LMC stands for an"irregular type galaxy," the "Large Magellanic Cloud," a "faint *cloud* in the night sky of the southern hemisphere...undergoing vigorous star formation activity." Indeed, we are "irregular" in that we consciously and joyfully (re)combine and (re)connect what academic specialism has separated over the last 150 years so that our work may have an impact inside and outside the ivory tower. Our "vigorous star formation" includes faculty who garner major grants with the National Science Foundation, National Endowment for the Humanities, Andrew W. Mellon Foundation, and Bill and Melinda Gates Foundation, and who disseminate their research in renowned academic publications as well as discuss it publicly in the national and international media. Most recently, we added a cluster of stellar colleagues in Black Media Studies, with focus areas including Hip Hop Studies, Black Feminism & Afro-Futurism, Black Twitter, and Video/Film Production.

And where have our "star" graduates gone in recent years? At the undergraduate level, their innovative and wide ranging educational experience helped them obtain positions with the Woodruff Arts Center, Turner Classic Movies, Florida State University, College of William and Mary, Michael Kors, Make-A-Wish Georgia, CareerBuilder, Graphic Dimensions, Mailchimp, Asset Marketing, Huron Consulting, Salesfusion,

Electronic Arts, Microsoft, Boeing, AT&T, IBM, General Motors, Google, ThoughtWorks, and Sapient Nitro; at the graduate level, they have secured positions at the University of Georgia, Rensselaer Polytechnic, New York University, or have been hired by Nokia, Disney, Google, and Turner Broadcasting.

Because our numerous achievements are not always visible in a traditional academic culture based on compartmentalized disciplines, we thought we should make more transparent what is happening in our own "irregular galaxy." Each of the stories in this volume grants insight into what awaits you, should you choose to join us as a student, faculty member, staff member, or visitor. However, while each of the stories can offer only one "slice" of LMC's activities, reading the entire volume reveals the mission that unites us in spite (perhaps because) of the diverse nature of our backgrounds, experiences, and specializations: We strive to provide interdisciplinary humanistic perspectives in an increasingly technological world.

Please get in touch if you wish to learn more about how we work at the intersection between science & technology and the humanities & social sciences. Come join us in our very own creative "cloud."

Richard Utz, Chair
& Karen Head, Associate Chair

Joycelyn Wilson

The Hip Hop Archive as a Design Issue

Hip hop culture and its intersections with the science of teaching and learning rapidly became a significant area across the field of humanities-centered educational research. Scholars and practitioners continue to make significant contributions to hip hop pedagogies, praxis, and theories as the area enters its twentieth year since Greg Dimitriadis wrote Performing Identity/Performing Culture: Hip Hop as Text, Pedagogy, and Lived Practice (2001). As hip hop studies continues to grow across disciplines, new generations of scholars produce ground-breaking pedagogical and curricular innovations in policy studies, mixed-methods research, STEM, digital media, and the humanities. What if, however, the learning science that is fundamental to the overall hip hop aesthetic was framed as a design issue? What kind of world would such a framing allow a user to inhabit or experience? Variations of these questions have been asked in curriculum design, yet not substantially funneled through the lens of critical design theories, which are mostly concerned with the set of principles and thoughts that interrogate the who, what, when, how and why of creativity in the building of media products and platforms. My current research addresses this theoretical and methodological lacuna.

Hip hop-based design studies (HHDS), as I refer to it, advances the broader field of hip hop studies, hip hop pedagogies, and their relationship with design research. It endeavors to understand how the aesthetic practices, creative sensibilities, techno-pedagogical foundations, and cross-industry adaptations of the artform are used as context clues and style norms when ideating, implementing, and building cross-cultural interactive media platforms. In my case, archival platforms. As an approach, it frames hip hop as a cultural application; that is, as a technology of education that fuses aspects of these four components across discipline and industry. In this way, hip hop-based design thinking (and the products that emerge from its application) centers the relationship between the art and craft of hip hop with its ability to use multiple modalities to communicate amongst diverse audiences. Hip hop-based design thinking is also a critical framework. It is concerned with how this mapping process influences, and is influenced by, the sociocultural context and emotional identities of users, learners, gamers, and practitioners who identify with the culture to various degrees.

I have continued to cultivate and refine HHDS in the creative and computational design choices that guide the development of the HipHop2020 Innovation Archive. The HipHop2020 Innovation Archive is currently

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supported by the Digital Integrative Liberal Arts Center (DILAC) located in the School of Literature, Media, and Communication at the Georgia Institute of Technology. Recently, we received funding to further this project through a partnership with the Vertically Integrated Projects (VIP) Program at Georgia Tech, which is a program that enhances higher education by connecting undergraduate and graduate students with faculty for a long-term, multidisciplinary project.

HipHop2020 is also the flagship project of the Four Four Beat Labs, a maker space and digital pedagogies incubator. HipHop2020 includes a database of educational content that highlights activism, among other things, inspired by hip hop and hip hop-inspired artifacts. Within the archive, there are podcasts, instruction manuals, and other projects that serve as resources for enthusiasts and educators, alike. Its mission is to curate collections of Black media and innovative teaching and learning programs, and apply digital tools to publish open source, interactive media that sits at the intersections of culture, activism, music, and other attractive media forms/practices.

As the project principal investigator, I saw a need for hip hop-based design thinking after framing the hip hop archive as a design issue. The issues of process, space, use of space, the technological disruption of traditional learning spaces, the creation of new modes of learning, and its relationship to platform innovation all revealed themselves as design issues that needed addressing —particularly as HipHop2020's design journey intersects with the rise of hip hop pedagogies. This need was extended to course design upon realizing many design students and CM majors needed a rubric to guide their approach to creating dynamic products.

HipHop2020 includes a database of educational content that highlights activism, among other things, inspired by hip hop and hip hop-inspired artifacts.

“My School has a special relationship with LMC —with joint programs, faculty, degrees, and research efforts, the humanistic lens through which LMC views technology continues to enhance these collaborations in order to enhance the societal impact of all that we do.”

Ayanna Howard, Ph.D.
Chair, School of Interactive Computing

Kenneth Knoespel

A Laboratory for the Future of Higher Education

A young woman entering Georgia Tech asked about majors. She had perfect SAT scores and said pointedly, 'Can you assure me that I won't waste either half of my brain?' This question is revealing because often Georgia Tech students think they must define themselves within a single field, limiting their strong desire to explore their intellectual creativity by bringing together multiple disciplines. For me the question emphasizes the crucial importance of LMC as an intellectual and creative setting enriched by the strengths of all of Georgia Tech.

Through the work of many colleagues and the steady support of Georgia Tech, LMC has become a laboratory for the emergence of curricula that integrates the humanities with science and technology. In 2003 the National Academy of Sciences recognized the important of our work, noting in Beyond Creativity: Technology, Innovation, and Creativity that "The success and prestige that the school enjoys within Georgia Tech and the new-media community at large have created visibility that would have been unavailable if it had remained a traditional English department. With the help of creative campaigning by the [LMC], the engineers and scientists of Georgia Tech, faculty members who hold the majority of clout within the university, have had little trouble understanding the benefits and advantages of a program in digital media."

Thomas Friedman reinforced the importance of Georgia Tech's evolving curriculum in *The World is Not Flat* (2006): "What the Georgia Tech model recognizes is that the world is increasingly going to be operating off the flat-world platform, with its tools for all kinds of horizontal collaboration." The rapid expansion of digital technology has reinforced the ways in which science and technology engages with other disciplines. Today LMC includes not only faculty with distinguished work in literature and film but faculty with degrees in Engineering and Computer Science who have chosen to shape new degree programs that integrate work in the humanities with digital media. The consequences of this integration for our work at Georgia Tech have been enormous. The French philosopher Bruno Latour has remarked that LMC has become an important laboratory for the future of education. Over the past ten years, our work has become a model for universities not only in the United States but in other countries. Together with the Ivan Allen College, we have been able to develop exchange programs and summer abroad programs in Asia, Europe, and South America

LMC has become a laboratory for the emergence of curricula that integrates the humanities with science and technology.

When I arrived at Georgia Tech, I was using an IBM Selectric typewriter. Soon I had a dual-floppy IBM computer in my office. By 1989 I was using a GT-issued prototype laptop to transcribe Newton manuscripts at the Hebrew University in Jerusalem. I remember vividly the first e-mail I sent from my new home computer to a colleague at the university in 1987. I also remember the disbelief of aeronautical engineers when we presented 'a take-off and fly-away' of a helicopter on an Apple II computer rather than a Silicon Graphics machine. Together with colleagues, I learned that building degree programs that included applied work with computing and digital media enabled research that extended well beyond traditional boundaries in the humanities or social sciences.

Work at Georgia Tech has led to an undergraduate program in Computational Media and a graduate program in Digital Media that includes both a M.S. and Ph.D. A Bachelor of Science degree in Computational Media developed with the College of Computing has emphasized the importance of required courses in programming and the creative aspects of digital technology. The graduate program is recognized for its work in game development, augmented reality, digital theory, AI generated animation, interactive design, and Machinima. Nor do we forget our history: links between legacy media and digital media remain an important element in all the programs, as do the connections between humanities and science. The wildly successful Poetry@Tech, inaugurated ten years ago by the American poet, Thomas Lux, has become recognized across the country. Supported by generous endowments from Henry Bourne and Bruce McEver, Poetry@Tech reaches beyond the undergraduate and graduate programs to demonstrate how the study and the practice of poetry, often regarded as the core of the humanities, also works at the creative center of digital media.

Our collaborative educational laboratory is exemplified in the course on Global Issues and Leadership that I have developed with the head of the School of International Affairs. The course brings students in the humanities and social sciences together with students from across the campus. Together the students develop briefings on major social and political issues confronting the United States and the world. Chemical warfare, food deserts and obesity, the impacts of widening the Panama Canal, public education, digital security, and economic development in Africa have been among the projects presented. Each problem area has been presented to visiting leaders such as Senator Sam Nunn, Ambassador Andrew Young, Congressman John Lewis, Vice President of Coca-Cola Javi-

er Goizueta, President and Executive Director of Georgia Public Broadcasting Teya Ryan, and President of the Georgia Partnership for Excellence in Education Steve Dolinger. Rather than focusing attention on a single discipline, the seminar stresses what is learned from applying the expertise of multiple disciplines to major problems confronting our societies. The course opens the artificial lines that often separate the humanities from other disciplines, and has reinforced the strength of Georgia Tech's Core Curriculum that requires all students to have competencies in math, science, and computing.

I developed another seminar, 'Witness to a Changing Conscience,' with GT Professor of Practice and Poetry@Tech visionary Bruce McEver, in which we explore the ways that major authors have documented changes in their thinking through their fiction and autobiographical work. Our students have considered Marcus Aurelius, Augustine, Montaigne, Jefferson, Emerson, Gandhi, Tolstoy, Martin Luther King, Thich Nhat Hanh, Flannery O'Connor, Orhan Pamuk. Recent visitors to the class include United States Presidential Medal of Freedom recipient Bill Foege, Harvard Divinity School Research Professor Harvey Cox, and the writer and journalist Tom Schachtman.

I have often described LMC as an archipelago of teaching and research. Richard Utz, our current chair, recognized the school's important work in Science Fiction by reminding us that we have become a Large Magellanic Cloud! The metaphor illustrates the importance of LMC's relations with disciplines across the Institute. We are hardly isolated and are vital to the very future of Georgia Tech. We are participating in building the new university by building a living laboratory for the future of education with colleagues across Georgia Tech. I'm proud that each student who joins us helps in building a new university.

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“Literature, media, and communication are some of my favorite things! Our LMC school’s roots run deep, all the way back to the birth of Georgia Tech in 1888. Since then, our LMC colleagues have continuously educated Georgia Tech students and conducted research that enriched the human experience. But now, the role of LMC is no longer simply a supporting one, for our most challenging problems are not solvable with technology alone, but must be tackled using our hearts as well as our minds. Our LMC school continues to deliver on its wonderful mission to “define new models of intellectual inquiry and practice that bring diverse humanistic perspectives to bear on technological invention and innovation”. What LMC@gatech teaches and creates is absolutely essential if you care about our future.”

Chauoki T. Abdallah,
Executive Vice President for Research

Brian Magerko

ADAM, EarSketch, and I

As both a cognitive scientist and a computer scientist, I have always been keenly interested in the formal representations of thought. Cognitive processes, knowledge, artificial intelligence—these are the phenomena that fascinate me.

What I had not noticed as a student was how consistently, when left to my own devices, my studies in cognition and computation veered off the steady path and swirled together in projects with a heavy humanities focus. Senior year: a robot comedy improv troupe; Advanced Artificial Intelligence (AI) course: a neural network for recognizing chorales written by J.S. Bach; dissertation work: an AI approach to creating interactive narratives.

There is a sublime beauty in the intersection between cognition and computation I had not realized in my early years. I had been too focused on games being the "it" medium in which to work, rather than looking at games—and digital media in general—as a means to an end—one of many trees in the forest. Three years into my career at Georgia Tech, when required to provide narrative to describe my career path for peer review, I had an opportunity to look beneath the surface and genuinely consider why I do what I do. Upon reflecting on my past and future work, it became obvious that creativity was the glue holding everything together: Understanding human creativity better, formally representing human creativity in computational systems, and supporting human creativity to support engagement and learning in digital media artifacts.

Creativity as a formal concept is the siren call of a phenomenon ridiculously hard to study and even harder to formally represent in computational systems. Still, creativity is one of those parts of the human experience that makes life so incredibly rich on a daily basis. It leads to surprise, to emotion, to connecting with others in a visceral and sacred way. It seems only natural to explore creativity as a first class phenomenon in the kinds of systems—cognitive systems—in which it exists. How are people creative? How can people be creative with computing to improve their cognition and learn? How can computers be creative? How can computers and humans be creative together to shape new creative paradigms and domains? Answering questions regarding the overlap between computing, cognition, and creativity is at the heart of the work we do in the Adaptive Digital Media (ADAM) Lab at Georgia Tech.

The research we engage in runs the spectrum from studying human creativity, creating computational representations of creative cognitive processes, to doing practice-based research that engages human creativity

and cognition while becoming computationally literate. We study improvisational actors and pairs of people playing "pretend" as a way to better understand how people generate shared meaning together and how they collaboratively perform and unravel a story through their interactions over time. For example: We built a movement-installation piece built on the back of contemporary movement theory in dance and theater. And even our educational media work relies heavily on the potential of computing as a creative form to inspire and engage learners, like our EarSketch project described below.

EarSketch is a multi-disciplinary research project, funded by the National Science Foundation, that explores how computational thinking can be taught through authentic artistic practices.

EarSketch is one of the most surprising and oddly successful works to come out of the ADAM Lab. Rather than focusing on understanding human creativity to computationally represent it, this work engages learners in a creative practice—remixing music—by writing programming code. EarSketch is a multi-disciplinary research project, funded by the National Science Foundation, that explores how computational thinking can be taught through authentic artistic practices. We use computational music remixing (i.e., using code to manipulate loops, beats, and effects) as a means of captivating high school students' interest in traditional introductory computer science practices. This involves a collaboration between academics; Atlanta high school teachers and policy makers; evaluators; and music industry professionals, such as Young Guru (Jay-Z's DJ and producer) and Richard Devine (internationally known electronic musician and sound designer).

The EarSketch environment consists of a Python code editing environment, a pedagogically appropriate Application Programming Interface (API) for remixing, a digital audio workstation, and a social media sharing site where students can share their projects and remix with each other's code. Students apply core computing concepts such as iteration, recursion, user-defined functions—in a domain that is both technical and expressive. And they learn basic aesthetic concepts in musical composition hand-in-hand with computing concepts.

This work has been piloted at multiple Atlanta-area schools and has been shown to both effectively teach computing principles as well as serve as a highly engaging learning domain for students who are traditionally underrepresented in computer science. It has also been used in an massively-online course on music technology, with over 10,000 students registered. While EarSketch has succeeded in teaching computing and increase student interest in computing as a discipline in general, success rates were even higher for underrep-

resented populations across gender and ethnicity. Women in particular are strongly motivated by the EarSketch experience and often change their attitudes about computing and their role in it.

EarSketch wants to offer an innovative, authentic learning experience for high school students that is both effective and appealing to students of different gender, ethnicity, and class backgrounds. We believe it has great potential to be used nationwide as a tool for learning computation and music technology. The curriculum and software are all freely available at http://earsketch.gatech.edu.

I would contend that EarSketch is the most symbolic work to come out of the ADAM lab in terms of showing the relevance of the arts and humanities to computing. By tightly integrating music production and programming, computing becomes more relevant to learners, especially those who may be turned off by it otherwise. There is something powerful about that combination that cannot be captured by music or programming alone; treating the computer as an expressive medium is as significant a mental turn as thinking of the typewriter as a medium for writing stories or canvas for painting. Computing has the potential for being a new humanistic domain, in which creative practice involves computation as a way to communicate vision, as a collaborator, and as a means for forcing us to better understand ourselves, to formally consider why and how we engage in our various creative activities.

Rapper, Young Guru with a student at Lanier High School Elementary, going over his EarSketch assignment.

“I do not want to imagine a world of future business leaders who cannot communicate, who cannot critically evaluate evidence, who cannot consider the implications of technology, who cannot construct and make meaning from interactions, who cannot understand our cultural embeddedness. Thanks to LMC, I don’t have to imagine this scenario for the Scheller College of Business graduates. They learn a broad mindset from their LMC classes that enables them to see a different view of humanity, and its interface with technology. Their perspective, and our future, is enhanced for the better because they learn in and out of classes with LMC majors.”

Terry Blum, Director, GT Institute for Leadership and Entrepreneurship; Tedd Munchak Chair & Professor, Scheller College of Business

Carol Senf

Why We Need the Gothic in a Technological World

Living in a world that purports to value scientific predictability while teaching (for 32 years) at an engineering school, it's sometimes hard to justify why I value the Gothic and argue that it is even more essential today.

It's not because I'm besotted by tradition though I am fond of the architecture often described as Gothic. Originally built in Europe between the 12th and the 16th centuries and later revived in the 19th, Gothic architecture is identified by the ribbed vault and the flying buttress, both of which allowed for dramatic interior spaces that are literally filled with light. Think Notre Dame in Paris, the York Minster, or Westminster Abbey. Of course, one need not go to Europe for a Gothic fix: the architect who designed the Tech Tower and its sister buildings at Agnes Scott and Clemson echoed the aspiration evident in medieval Gothic, as did the architect for the postmodern building on West Peachtree formerly known as the IBM Building.

However, Gothic or The Gothic is associated with other arts as well. Not only does Gothic refer to an extinct Germanic language, but it also characterizes several kinds of script or typography: 1) A script used in Western Europe from approximately 1150 into the 17th century, and 2) sans-serif typography, such as Ariel or Helvetica, often used for dramatic headings. And to make matters even more complicated, there's also Gothic music, a type of rock and roll, and Gothic clothing—think Wynona Ryder in *Beetlejuice* or almost anything by Tim Burton.

While I'm fond of Gothic architecture, having never met a Gothic cathedral I didn't like, and use Gothic type regularly, they aren't what I think of when I argue that the Gothic is essential in the modern technological world. Indeed the Gothic as I see it encompasses some of the previous examples I noted, being a way of describing (or attempting to describe) or responding to a world that cannot be fully explained by science or mathematics, a world that is large enough to include the mysterious, the liminal, and the terrible.

The Gothic as a way of seeing the world originated at the end of the eighteenth century, when a sense of scientific certainty was beginning to emerge. I suspect that the Gothic was, even then, a counterbalance produced by writers and thinkers who felt limited by such a confident worldview and recognized that the power of the past, the irrational, and the violent continues to hold sway in the world. Two hundred (and more)

years later, there's much that science cannot explain and problems that technology cannot solve. Some days it's easy to feel paralyzed by forces beyond our comprehension and beyond our control.

To get a handle on the Gothic, it helps to go back to what is arguably the first "modern" example, Horace Walpole's 1764 novel, *The Castle of Otranto*, which he subtitled "A Gothic Story." Walpole noted that he wanted to combine elements of the medieval romance, which he found too fanciful, and the modern novel, which he believed was limited by the very ordinariness of realism. Hence he invented an antiquarian who discovered the fragments of an ancient manuscript and set it in a medieval castle. That manuscript tells of a villainous aristocrat who will do anything to gain power and of several persecuted female characters who attempt to elude his control. Writers, filmmakers, and video game designers often adapt these conventions. Thus we have come to expect persecuted heroines, inscrutable villains, supernatural forces, and decaying medieval structures in works described as Gothic.

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An easy formula to adapt, one might say, but the Gothic has been well adapted by Mary Shelley (*Frankenstein*), the Brontes (*Jane Eyre, Wuthering Heights*, and *The Tenant of Wildfell Hall*), Henry James (*The Turn of the Screw*) and Bram Stoker (*Dracula*), not to mention Poe, Faulkner, and Stephen King many of whom adapt the conventions to explore their own worlds and add a convention (that of multiple narrators as if to remind readers that no single human being has the whole truth).

Stoker brings a monstrous figure from the medieval past to London, the heart of Empire. Juxtaposing past and present, Stoker opposes this figure with everything that modern science and law have to offer—the power of combination—and tracks Dracula to his Transylvanian lair, the very name "beyond the forest" evoking mystery. Using the tools of Empire, the kukri knife and the Bowie knife, Stoker's "Crew of Light" seems to destroy Dracula, and a brief epilogue shows them seven years later at the site of their victory. However, the easy victory fails to satisfy. Readers may remember Van Helsing's observation that nothing manufactured by human beings could destroy the vampire, and evidence from the manuscript suggests that Stoker contemplated destroying Dracula's castle at his death, but someone—Stoker or an editor—excised the paragraph in which the castle is destroyed. Having the vast ruined castle loom over the human characters is somehow more satisfying, as it suggests that the mysterious forces Dracula represents by are somehow more powerful than contemporary science and technology, which often fail despite the smug self-assurance of both scientists and representatives of the legal system.

Students "get" Stoker's message about the limitations of science. Scientists and programmers, Tech students know there are things they do not understand and over which they have no control.

Students "get" Stoker's message about the limitations of science. Scientists and programmers, Tech students know there are things they do not understand and over which they have no control. Much as they want easy answers, they see complexity around them. Emphasizing multiplicity and complexity is what Gothic does best. Because I see my job as reinforcing that suspicion of easy "one size fits all" solutions, I believe that the Gothic is essential to our technological world.

Katie Farris

The Importance of Art in a Technological World

No matter how hard you work in this life, no matter how smart you are, how careful you are, or how rich you are, how privileged you are, how supported you are, how much community you have, how much education you have, no matter even if you think you've trained yourself to be numb or not to feel anything anymore; no matter what, there will be times in your life when you will spin out of control; when you will be flat and gasping, and alone in front of what it is you fear the most—death, illness, ruin. No one is spared this. And just when you have no words, and just when you have no hope, this is when you need art, to express what does not and cannot make sense. You cannot understand or control some things; they can only be felt and expressed, as Dylan Thomas writes to his dying father in the final stanza of his poem, "Do Not Go Gentle into that Good Night":

> And you, my father, there on the sad height,
> Curse, bless, me now with your fierce tears, I pray.
> Do not go gentle into that good night.
> Rage, rage against the dying of the light.

No matter how hopeless you are, no matter how few opportunities you took, or were ever given; no matter how poor you are, how unsupported you are, how alone you are in this world, how little education you were able to have, no matter even if you think you've trained yourself to be numb or not feel anything anymore, no matter what, there will be times in your life when you will feel ecstatic; when some feeling inside of you will rise up and reach the boundaries of your heart and overflow and fill up all your body and reach out to the margins of your skin and overflow, and you will be witness to awe, to wonder, to beauty. No one is spared this, either. And just when you have no words, this is when you need art, to celebrate this thing inside of you, as Lucille Clifton shows in her poem, "won't you celebrate with me":

> won't you celebrate with me
> what i have shaped into

a kind of life? i had no model.
born in babylon
both nonwhite and woman
what did i see to be except myself?
i made it up
here on this bridge between
starshine and clay,
my one hand holding tight
my other hand; come celebrate
with me that everyday
something has tried to kill me
and has failed.

The importance of art in a technological world is the same as the importance of art in any world: when the brilliance or the darkness is too much to hold inside, we must give it an outlet.

At Georgia Tech, we celebrate our students as makers. In my classes, after we discuss the importance of art in a technological world, we talk about the fact that one thing artists make is meaning.

Meaning is built just as a building is: from component parts. What are the building blocks of a poem, story, essay, or hybrid-form work? What materials are appropriate for which applications? How can one ill-placed rhyme bring a whole poem crashing to the ground, just as if you'd misplaced your keystone? How is a scene like a brick, and exposition like mortar? How do you guide a reader from image to image in a poem, just as a skilled architect can help guide an individual through a train station or stadium? How can one build a text for an idea or experience that's never been expressed before, just as someone had to build the first theater or indoor skydiving "experience"?

How do we take all these building blocks together and compose something entirely unique, like a building that redefines what space can do, or like a musical instrument built and played for the first time redefines what music can be?

After learning about making meaning, and trying it for themselves, how do students learn to deepen their engagement with their own work and with each other in a meaningful way? They learn how to create feedback. Each student is expected to write a response to each of their peers outlining how that peer created their piece, discussing what specific moments excited or confused them, why those particular moments had that affect, and suggesting, if relevant, possible solutions to inconsistencies they note between the author's intention and their execution. Finally, I give each student a response on their responses, telling them where they excelled and where they need further work to create even more constructive, compassionate, and effective feedback. These multiple layers of engagement: analysis of text, imitation, analysis of imitation, and analysis of analysis create a productive feedback loop that keeps students engaged and learning. In this process, we are not only making art, but we're also making relationships—in both, we find meaning.

There are no perfect formulae for the process of making—rather, every work must find its own way, using concepts, parameters, and examples of works that have existed for centuries. The same holds true for technology: after all, the very word is derived from the Greek word τέχνη.
Its meaning? Art.

boysgirls

katie farris

“In times of great turmoil in a society or even in times of great euphoria, we often turn to our humanities to help us reflect on why**? or perhaps** why not**? and to use that knowledge in moving forward. What do we need as a society? What do we want? Where should we be headed?”**

Bonnie Ferri, Ph.D.
GT Vice Provost for Graduate Education and Faculty Development

Michael Nitsche

What I Make

Somewhat hidden away on the top floor of the Student Center at Georgia Tech is the craft center. The size of a large classroom, it features some pottery wheels, shelves, paints and brushes, tools, workbenches, but no computer, screen, or projector in the main area. The doing, at least here, is physical. You come in, put on an apron, collect your tools, and sit on the wheel. It is a great place to work on media.

Stuff and its making is personal matter. We build not only a frame for a house to have a sheltering roof but also one for ourselves to define who we are—willingly or utterly unaware of the consequences. This equally applies to digital artifacts but it becomes evermore complicated when those artifacts are procedural machines themselves. Whether we build a digital media artifact—like an interface, a video game, a 3D world, a web site—or whether we use one—play a game, surf the web, text on a cell phone—the action is a defining one not only for the digital world but also for us, as we are constantly recreating ourselves anew through it. What creative practices make up these actions and how can we claim them—or in some cases re-claim them from legal or technological straight jackets—back for the human who makes the action and herself through it?

In today's globalized economies craft is a marginal player. Making your own mug might very well be more expensive than buying an imported one. It probably will be more flawed and it certainly will take more time. As commercially viable production, craft is hard to sustain. Leaning on craft is also not treading a way back to Ruskin-infused utopias of yesterday. There is no step out of a mediated society, which is why we need every help we can find to live within it. Sidestepping the vocabulary and practices of "virtual" digital media by focusing on the wet clay spinning under your hands is not a revivalist rejection but a gesture of reclaiming and recontextualizing. From a design perspective, it supports the realization that our actions are never virtual but remain constructions of self and others. From a technological perspective, it emphasizes the "physical" and the "things" in expanding fields such as physical computing and the Internet of Things.

At the far end of the Ferst Center, not too far from the craft shop, a second place deals with this challenge in its own way. Georgia Tech's black box theater is the home to DramaTech and lays claim to be the longest continuously running theater in Atlanta. Whenever possible, I take my students for at least one session per term into the black box. At times we awkwardly play between the set pieces of some stage production or present our concepts and ideas literally from a stage using props for an upcoming musical. We have conducted Improv exercises, dance workshops, puppetry rehearsals, cell phone theater, among other things—all in pursuit of digital media design.

Performance is production like crafting, but of expression. It is a form of making and setting a frame. The black box is not only an inspirational place, it is also a testing ground for the performance of self that digital media inherently include. Theater, much like craft, is largely seen as a niche media, surpassed long time ago by film, television, and video games. Yet, once again, the turn to performance is not a revisionist step back but a necessary move forward as the digital transcends our everyday life. Pressing a button on the keyboard at our working desk, looking at the screen of a cell phone during a bus ride, and being motion captured by a game console as we exercise in our living room—these are relevant actions not only for the digital device but also for our surroundings. They make the spaces not only in the virtual worlds they are read into, but also in the physical worlds where they originate.

Because digital media remains a developing field where new challenges rise seemingly with the cycles of next gen game consoles and smartphones, we need spaces like craft shops and theater stages. They are practical workshops for creative activity that is at the heart of our interaction with digital stuff. My work as a digital media designer is explorative as it tries to grow with the field. To do so, it builds on those spaces of practice. Explorative means that it develops prototypes and classes that help us to ask new questions, instead of teaching pre-conceived answers. Exploration means that we produce analyses of the existent mediascapes as well as relevant questions to challenge them—in theory and practice. The shop and the stage are two locations that help us to do exactly that.

Jay David Bolter

Examining and Changing a World of Media

We live in a world of media, especially digital media, and the changes in the ways we use media constitute one of the major cultural stories of the past half century. The developments in the 1970s and 1980s (cable television, VCRs, CDs, desktop computers and then laptops, and computer communication mediated by modems) were followed by videogames, the introduction of cellphones, the World Wide Web, and the explosive spread of the Internet in the 1990s, and then by smart phones and social media in the 2000s. All but the poorest among us have cell phones, and the use of computers and the Internet for entertainment and social communication now rivals or surpasses commercial and business uses. According to a study in 2011, nearly 30% of all Internet traffic into the American home in the evenings is accounted for by Netflix and other streaming films and television services. Because these media surround us, it is easy to ignore the prominent role they now play in our lives. Because young people have grown up with so many media devices and services, and their parents have grown old with them, it is easy to forget how much our media landscape has changed in the past 50 years.

If we could somehow transport an American through time from 1960 to 2010, she would have little trouble adapting to everyday life and little reason to be surprised, except in the crucial areas of media and communications. As she walked along the streets, she would be puzzled to see many of the passers-by holding miniature walky-talkies to their ears or tapping on tiny keyboards and screens, while many others appeared to be listening to music through headphones attached to tiny transistor radios. If she walked into an office building, she would be struck by all the individual computer consoles with videoscreens, which have not only replaced typewriters on the secretaries' desks, but found their way to the desks of technical workers and even executives, who never typed their own letters in the 1960s. If she visited a home, she would find more computers—in a father's or mother's home office, in the children's bedrooms, and perhaps even in the kitchen. Occasionally she might find the family watching television together, but it could now be an enormous flat-screen television of astonishing clarity with hundreds of channels as well as instant access to films and whole television series, streaming from yet another computer. More often, she would find various family members using their own media devices, and she would notice that the children were ap-

If we could somehow transport an American through time from 1960 to 2010, she would have little trouble adapting to everyday life and little reason to be surprised [...]

parently typing messages to one friend on the same computer or tablet with which they were talking to another. A few years after our time traveler left, Stanley Kubrik's epic film *2001* (1968) would have shown her an astronaut making a video phone call (handled by AT&T) back to earth. By 2010, though, everyone seemed to be able to use their small computer screens to talk to and view each other, and their video camera, embedded at the top of the screen, was like a tiny version of HAL's oculus.

Perhaps nothing in our culture today would mystify a visitor from 1960 more than social media such as Twitter, YouTube, and Facebook. These forms of expression have analogies in practices that she knew (writing letters and greeting cards, making home movies or audio cassettes, pasting travel photos into albums as keepsakes and to inflict on friends and neighbors), but their technical configuration and their manic attraction for tens of millions of Americans and hundreds of millions of people around the world would have been unimaginable in 1960.

If we tried to sum up the changes in two words, they would be "ubiquity" and "diversity." All sorts of media products and services are available everywhere, for a price, and, despite the predictions, all these products and services have not melted into a single universal form. Charting these changes and considering their meaning for our current cultural moment is the task of the discipline called "media studies." And it is one of the disciplines that we practice here in Literature, Media, and Communication (LMC).

As valuable as media studies is, however, it can only provide us with a clearer understanding of the history that has led to our current cultural moment. The exciting next step is to take an active role in shaping the future of media. That task belongs to the Digital Media program in LMC, where faculty members, graduate students, and undergraduates create and test prototypes for new digital media forms. These experiments draw on our understanding of the origins of digital media and the relationship to the important forms of the past (such as film, television, and the printed book). But they also explore the qualities of digital media that distinguish them from their predecessors, such as interactivity and procedurality.

For example, I work in the Augmented Environments Lab (AEL) with colleagues and students to design new forms of entertainment and informal education using the technologies of augmented and mixed reality. Imagine that you are walking down historic Auburn Avenue in Atlanta, Georgia. "Sweet Auburn" was the center of African-American culture during the first half of the 20th century. Your smart phone can be your guide, providing stories about the musicians, preachers, businessmen, and civil-rights activists as you pass by the buildings where they lived and worked. You can see photos of the Royal Peacock club from the 1940s, superimposed on the current building, and hear the music of Duke Ellington, who played there. The voice that accompanies you on your walk is that of Andrew Young, one-time mayor of Atlanta and an activist who worked with Martin Luther King. This is the kind of experience that we are creating in the AEL. Such experiences are not only experiments with a new technology, although it is great fun to put these new mobile devices with high-quality graphics, cameras, orientation and positioning sensors through their paces. Our experiences also depend on the lessons in design and media studies that we draw from looking at our rich media heritage of the

“LMC research and teaching encompass a world of literature, media, and communication! Remarkable are the scope and depth of work in computing and digital design, gender and race, film, performance, and science fiction. LMC defines what it means for faculty and students to take humanistic perspectives in a technological universe!”

Mary Frank Fox, Advance Professor,
GT School of Public Policy;
Co-Director: Center of the Study of Women,
Science, and Technology

T. Hugh Crawford

Making Theory: Useless Design/Risky Pedagogy

As a technological institution, the Georgia Institute of Technology embraces design studios as fundamental to its pedagogical mission. In my work teaching the humanities at Tech, I make a serious effort to incorporate some design practices into classes, helping the students understand the complexity that making entails but also to build on the learning that making produces. Put simply, a student who has squared a round timber with broadax and adze has a different understanding of the second chapter of Thoreau's *Walden* than the casual reader.

I use the term "Useless Design" to designate a pedagogical practice where the product being designed has little or no inherent economic or instrumental value, and the primary skills involved in its production will not likely be useful in a student's academic or professional career. Learning the basics of blacksmithing or timber-framing does not generally lead to professionally useful skills for a Georgia Tech graduate. Instead, my purpose is to get students to become attentive, to think deeply about processes, to reflect on why they do the things they do, rather than measuring their success by making a practical application. This is where my approach diverges from many of the Georgia Tech design practices which are concerned with bringing a useful device or application to market. Useless Design helps students slow down, focus on and articulate both the familiar and the unfamiliar parts of making. Useless practices prompt naive questioning that probes historical circumstances and social norms, and helps develop a humanistic perspective on a technological world. By recasting technology as a set of practices that must be learned and articulated through an historically sedimented space, I try to foreground making as a process that draws across many disciples and blurs most of those disciplinary boundaries.

David Pye, design theorist and master woodworker, makes a distinction between what he calls the workmanship of certainty and that of risk. Although he does not privilege one term over the other, he makes an effort to draw out the positive value a workmanship of risk can produce. Briefly, a workmanship of certainty involves the use of uniform materials and a highly regulated set of tools (tools that minimize an operator's mistakes or variations). A workmanship of risk, on the other hand, deploys non-uniform mate-


CLIMB AT YOUR OWN RISK!!

rials with generally unregulated tools, demanding of the worker careful attention through each step, an intimate understanding of both material and tool, and an awareness of ongoing and impending failure. Such workers approach the task with care and humility, and never stop learning from the material, the tools, and the practice. To paraphrase George Sturt, they must become "friends, as only a craftsman can be, with timber and iron. The grain of wood [tells] secrets to them." Pye's notion of the workmanship of risk helps define a pedagogy of risk, one where the final products are not clear, nor is the path to get there obvious. A pedagogically risky class approaches assignments with care, humility, and openness. It recognizes that the class, its projects and its practices must also be designed in an iterative process. The work is open-ended and exploratory: assignments, competencies, and labor are renegotiated and redistributed constantly, while all materials, tools, and practices are carefully questioned and historically situated. As the philosopher Martin Heidegger argues, risk discloses new worlds.

Crafting Learning:

"Freshman Composition (1102)." The subject was the history of trees—primarily as commodities. After a series of readings and several paper assignments, the students decided to collaborate on a project focusing on the history of building practices, skill acquisition, and the role of modeling in knowledge production. They built three slices of a building that could be assembled into a small playhouse (not completely useless) via three teams: one researched 19th century building and made a timber-framed "bent," one did 20th century building with dimensional lumber, and the last did 21st century building with plywood "slot and tab" techniques cut out on a large CNC machine. They made hand drawn plans, CADed plans, 3D printed or laser cut small scale models, and full scale section models. At the same time they developed a set of learning objectives, and produced a series of exhibition materials including an illustrated magazine on the history of timber-framing, dimensional lumber construction, and the history of plywood and CNC production. They wrote essays on modeling, design and "learning by doing," and made animated GIFs of CADed plans, videos showing building, posters on history of materials, and, of course, a web page.

[...] a student who has squared a round timber with broadax and adze has a different understanding of the second chapter of Thoreau's Walden than the casual reader.

"Major Author Seminar: Herman Melville's *Moby-Dick* and 19th Century Technology." Students read the novel as an encyclopedia of 19th century technology, with each producing a research project on the relation of that technology to 21st century practices. In addition, they chose several technol-

After reading Thoreau's masterpiece, *Walden*, the class proceeded to frame up a full scale version of his house using only the tools he could have used: axes, adzes, chisels, and hand-saws (no power tools).

ogies to understand through "hands-on learning" including rope production, knot tying, celestial navigation, candle production, blacksmithing (they forged a harpoon on an anvil), and a 22 ft. plywood model of a whale skeleton cut on a CNC machine eventually donated to a south Atlanta nature center.

"Major Author Seminar: Henry David Thoreau." After reading Thoreau's masterpiece, *Walden*, the class proceeded to frame up a full scale version of his house using only the tools he could have used: axes, adzes, chisels, and hand-saws (no power tools). They went to the woods, chopped down trees, squared them with broad axes, and framed up the building. They also wrote essays, made a documentary film, and presented their research at several scholarly conferences.

Each of these projects' uselessness is their greatest asset (e.g., the harpoon will thankfully never strike a whale). Instead, the students questioned each step in their processes, discussed at length any design proposal, and constantly reframed forms of mediation and the goals of their research. They learned that all materials—wood, paper, 3D printing, iron, words, etc.—are recalcitrant, and that making involves both designing objects and designing learning.

Qi Wang

Mapping Cinema and the World

Our current globalizing world is experiencing an unprecedented rate and scale of technological development and media updating. With Twitter or Facebook friends, familiar or new, in America or Asia, broadcasting diverse daily lives and sharing links to unimagined information, how might an individual brace against this overwhelming wave of information without getting swept away and losing a sense of time, identity, and direction in life in the act of easy connecting? Other than the necessary technical knowledge of codes and skills, how might a student—as a young person with much potential and promise that needs to be tapped carefully and wisely—learn to emerge out of that ocean of information and demand in order to become an ably equipped navigator of contemporary life, not merely as a user, consumer or tourist but more as an informed traveller and a capable creator of good technologies? The latter image, in my understanding, is what the official strategic plan of Georgia Tech identifies as one of our five goals: graduating "good global citizens."

With its necessary combination of arts and technologies, the field of cinema and media studies is doubtless a highly productive place for the education of students as intelligent citizens capable of seeing through films and other cultural products as complex artifacts involving not only technology and industry but also culture and politics. On one hand, students are exposed to the most famous and aesthetically accomplished films and directors from all over the world. They learn the essential terminology/technology—e.g., narrative, mise-en-scène, cinematography, and editing—whose varied uses have created such fascinating yet diverse styles by directors like Alfred Hitchcock, Akira Kurosawa, Michelangelo Antonioni, Yimou Zhang, and others. On the other hand, they explore questions like: why did the genre of film noir—with its nights, shadows, and rainy streets even when set in Los Angeles—happen to reach its fullest development at no other historical moment than the mid-to-late 1940s? Why in Hitchcock's stories of murder do we tend to find images of an eye, a whirlpool, a man who knows too much and a woman who knows even better? What kind of culturally and/or historically specific understanding of architecture, space and existence lies in the long takes of Antonioni (Italy), the grid-like formal structure in Yasujiro Ozu (Japan), and the unforgettable choreography of colors in Yimou Zhang (China)? How and why did a certain director and/with a certain style happen to take form at a certain moment in world history? Obviously, questions like these demand an understanding of not only the textual details of a film, a director or a genre but also the contextual factors that informed their birth and growth. Through such guiding and training practices in the analysis and ap-

preciation of films as organic products of culture and history, it is my goal to cultivate in the students an augmented sensitivity for form and beauty, an enriching curiosity for the fuller pictures of phenomena (whether cultural, social or natural), and a deep desire and respect for what one does not yet know or know fully enough.

As a member of the film faculty in LMC, I both teach general film courses and specialize in East Asian film studies. Whether speaking about Chinese martial arts cinema, or world-famous filmmakers from East Asia, or the theoretical (yet also highly applicable) subject of space and place in cinema and media, I am committed to cultivating

in the students a sense of comfort, confidence, and curiosity for non-Western cultural contents, forms, and patterns. Whether from East or West, the young adults of Georgia Tech deserve to be exposed to the very best. Wherever their home country is (though understandably with the majority from the US), the students of Georgia Tech are being prepared and encouraged to be at home in the world, being able to actively participate in its continual development as well-informed, well-prepared and healthily motivated insiders.

With that universalist educational goal in mind, in my various courses on East Asian and world cinema I tend to adopt a comparative approach. For example, in my Martial Arts Cinema course, I provide a survey of the history and theory of Chinese martial arts cinema and its international extrapolations in the context of transnational cinema. While it focuses on representative films, directors and performers from Mainland China, Taiwan, and Hong Kong in a largely chronological framework, it also introduces samples from Japan, South Korea, and the U.S.. For their projects students are encouraged to bring in relevant examples from any national cinema.

I also teach Space in Cinema and Media, a course specifically developed with the goal of inspiring students to think and explore their actual relationship with the world, which ranges from their current position at Georgia Tech near downtown Atlanta, their daily environment saturated with entertainment and social media as well as educational technologies, to their imagined or tentatively constructed relationship with other places, cultures, and histories, etc.. That course uses examples from cinema and introduce students to contemporary theories of spatiality. The students and I consider

Wherever their home country is (though understandably with the majority from the US), the students of Georgia Tech are being prepared and encouraged to be at home in the world [...]

the architectural, aesthetic, historical, narrative, physical, psychological, philosophical, social, and symbolic dimensions of the course subject, and examine how these might be mobilized productively to understand and describe space, its functions in cinema and media, and ways in which we as spectators, users, and critical subjects can relate to and learn from all those things.

As I have emphasized to the students in the classroom, I hope they will take the knowledge and questions thus learned and raised, continuing onto their own journey in education, work and life as curious, informed, and brave travelers. In their navigation through the competing allures and demands in life, I hope they will be able to create a most enriching itinerary or pattern—the map of their life—along which they are able to relate and contribute to the world and live their lives to the fullest.

President Emeritus Dr. G.P. "Bud" Peterson getting oriented at the Center by LMC's Karen Head

Karen Head

At the Center: Innovation in Research, Practice, and Service for 21st Century "Writing Centers"

In the 1970's a new unit began appearing in American universities: the Writing Center. These units were created to offer supplemental academic resources and tutoring for students who wanted to improve their writing. For many of the founding scholars, writing centers were designed to places that would support the interdisciplinary study of writing—places that could transcend departmental and disciplinary boundaries. Creating such spaces was also an attempt to transcend misguided ideas about what traditional English departments do; they are much more than places where students learn to write college essays—places that are often a focal point for developing critical thinking skills and illuminating the "why" of science and technology. These early scholars wanted to raise standards of and provide support for a variety of discourse communities throughout their institutions, offering non-judgmental spaces within which anyone could explore ways to become a better communicator. These spaces were designed to encourage frank discussions about rhetoric and composition across disciplines without connecting it to the harsher criticism of formal evaluation. In other words, these were places staffed by people who were not responsible for assigning grades, but instead focused on the higher goal of leading discussions about the importance of excellent communication for any purpose.

Unfortunately, the faculty, staff, students and administrators at many institutions considered writing centers to be mostly about remediation: places bad writers are sent to be "fixed" or "cured" or confined until they could meet expectations. While some people still believe such centers are only about remediation, we are pleased that the culture at Georgia Tech is helping subvert this notion: ours is a place where the best students seek to improve their communication competencies. Since our founding and my appointment as director of the Communication Center in 2011, my charge has been to make our center a benchmark for writing center research, pedagogy and practice—a place that returns to the ideal of a safe space for active debate and discourse about the best ways to communicate in a variety of modes.

While our center is relatively new (in comparison to many universities), the commitment to such work can be traced back nearly fifty years when one of the first two female instructors at Georgia Tech, Dr. Helen Naugle, co-opted an empty classroom and began tutoring students in writing. As an engineering school, our students have often lacked excellent communication skills, so it is no surprise that Dr. Naugle was looking for ways to supplement traditional classroom instruction. The seeds Dr. Naugle planted would take years to blossom, but she inspired conversations about founding a writing center at Georgia Tech that continued until her dream became my reality. In 2017, her family endowed the center and it was renamed for her.

As part of the innovative Clough Undergraduate Learning Commons, ours is a center granted a prime location with state-of-the-art technology and budgetary support from the central administration. Historically, many writing centers have been located in remote or undesirable spaces. Yet, here was a space designed for students, and I have always been keenly aware of its special nature. Our students benefit from a center full of all the bells and whistles—it has everything that writing and communication center directors wish for but rarely have: SmartBoards, video-capture and video-conferencing equipment, computer stations, scanners, iPads, and even a 3D printer. Our students also benefit from our ability to provide the very best tutoring staff; it is rare to have a sizeable professional staff of post-doctoral fellows who split time between teaching in the LMC writing program and tutoring in the center.

While some people still believe such centers are only about remediation, we are pleased that the culture at Georgia Tech is helping subvert this notion: ours is a place where the best students come to become even better.

Another part of our mission is to find ways to encourage students to become part of our community of learners and scholars. Foremost we want to disabuse students that our center is a last resort for the struggling. We want them to understand that this is place where exciting things happen, where even our best students come to hone their projects. Our work touches every aspect of life at Georgia Tech, whether helping students prepare research papers or presentations, make documentary films, develop scientific documents for the public, write novels, or master the art of public speaking. Communication is a fundamental component for success, and our center's mission is to help our students master the competencies they will need to be successful in their academic and professional lives.

From an everyday perspective, writing center work

is about having meaningful conversations: tutors and students talking about the best way(s) to communicate an idea. Technological tools can help make those conversations more productive, even more efficient, but it is the conversations that continue to matter most. From these conversations we also form many of our research questions and projects. Our professional staff members are already acknowledged as award-winning tutors as well as significant contributors in research journals and at research conferences. Additionally, we involve students in our research. In fact, some of the students who work in our center (as peer-tutors or as research assistants) have engaged in important research they have presented at prestigious academic conferences, and despite not being "English majors" have often won national tutoring awards.

In the last few years, conversations about higher education have often focused on questions about efficiency—when the questions should be about affordances. As we turn toward technology for answers, we must also ask important questions about what our students might gain or lose from the changes we implement. Certainly we want to offer the best educational resources to the greatest number of students. The Naugle CommLab at Georgia Tech is committed to innovation in teaching and learning, and because we are fortunate enough to have "all the bells and whistles" we will continue to pursue research that will help shape the ways centers are designed or redesigned, and the best outcome is that our students are the primary beneficiaries of this work.

Another part of our mission is to find ways to encourage students to become part of our community of learners and scholars. Foremost we want to disabuse students that our center is a last resort for the struggling.

Lisa Yaszek

Amazing Stories, or, Why We Do Science Fiction at Georgia Tech

In 1926 Luxembourgian-American inventor Hugo Gernsback published the first issue of *Amazing Stories*, a magazine that would go on to inspire the millions of books, films, graphic novels, and video games we now describe as "science fiction." Indeed, Gernsback was so passionate about this new mode of storytelling that he prophesied it would be "an important factor in making the world a better place to live in… educating the public to the possibilities of science and the influence of science on life…. If every man, woman, boy, and girl could be induced to read science fiction right along, there would certainly be a great resulting benefit to the community. Science fiction would make them happier, give them a broader understanding of the world, make them more tolerant."

I often wish I had a time machine to go back to 1926 and talk with Gernsback about the similarities between his dream and Georgia Tech's mission to solve twenty-first century problems by innovating at the intersection of science, technology, and the arts. Better yet, I'd bring him forward in time to see how many of us are contributing to that mission today by engaging with science fiction across media. I think he would be tickled pink—but not surprised—to learn about all the different ways we use science fiction as a focusing lens to examine the world's most pressing scientific and social issues and to imagine better futures for all. As we like to say here in LMC, science fiction is a truly global language that allows people to communicate their experiences with science and technology across centuries, continents, and cultures.

The notion that science fiction is a global language drives all my research activities. For instance, in *The Self-Wired: Technology and Subjectivity in Contemporary Narrative*, I explore how authors and filmmakers we don't associate with science fiction use characters such as "the cyborg" and story types such as "the utopia" to make sense of changing relations between science, society, and the self. In a related vein, my book *Galactic Suburbia: Recovering Women's Science Fiction* shows how women writing science fiction after World War II used their chosen genre to contribute to culture-wide debates about women's work as homemakers, activists, scientists, and artists—and how, in doing so, they changed the face of science fiction forever. Consider, for instance, Steven Spielberg's *Jurassic Park*: In the middle of the movie the female lead turns to a male scientist

Of course, science fiction isn't just for faculty at Georgia Tech. Rather, our students are partners in wonder who help us develop clearer pictures of science fiction as the premiere story form of modernity.

and says "the only thing that matters now is family." As a science fiction fan, I can't help but think the only thing that would really matter in that situation would be getting away from the human-eating dinosaurs. But ever since I wrote *The Self-Wired* and *Galactic Suburbia*, I've also been able to appreciate how Spielberg draws on the history of the genre he loves to get viewers thinking about the impact of science and technology on our most fundamental social units. And so by doing science fiction studies, I get to double my pleasure in science fiction stories themselves.

Another reason I do science fiction studies is that I get to use my expertise to collaborate with colleagues across disciplines. A few years ago I worked on a National Science Foundation grant with two public policy professors and a nanoscientist to determine how new ideas about nanotechnology circulate through the American imagination. Initially we assumed that scientists develop these new ideas, public policy makers create laws that regulate their application, and then finally writers and filmmakers "translate" them for the public. Much to my delight, however, we learned that we had it backward: authors have been speculating about the possibilities inherent in small-scale engineering ever since Jonathan Swift published *Gulliver's Travels* in the eighteenth century, while scientists and public policymakers have, since the middle of the twentieth century, shaped their own ideas about this subject in relation to science fiction! It was an exciting insight that made us realize science fiction is a lot like oxygen: invisible, everywhere around us, and something we breathe in without a second thought.

Of course, science fiction isn't just for faculty at Georgia Tech. Rather, our students are partners in wonder who help us develop clearer pictures of science fiction as the premiere story form of modernity. For instance, I begin my class on global science fiction with a brief history of American science fiction. I then draw on my own research to show students how African-American and women writers have generated their own rich traditions of speculative fiction, thereby challenging the clichéd belief that science fiction is "just about white boys and their toys." After students learn about American science fiction, they team up to research and teach their own units on science fiction around the

world. This is my favorite part of the class because I get to learn so much. Did you know that South American authors have been writing science fiction since the 1830s? Or that manga was a trivial art form in Japan until the government partnered with artists to export it to the United States in the 1980s? Or that the 2011 science fiction-superhero film *Ra-One* holds the record for the largest international theatrical release of an Indian film? Neither did I—until my students unearthed these facts. As it turns out, the story of science fiction is even more, well, amazing than I thought.

Finally, as my students and I like to remind people, science fiction is both serious work and serious fun. We aim to convey this message to both the greater Georgia Tech and the greater science fiction communities with our Sci Fi Radio Lab, a variety program dedicated to "the best in everything science fiction" that airs on WREK 91.1, Georgia Tech's student-run radio station, every Thursday at 7 pm EST. The mad labsters, as I like to call them, engage in a variety of on-air activities that include interviewing science fiction artists, producing science fiction dramas, and developing original segments such as "two minute madness," where listeners have—you guessed it, two minutes—to weigh in on the topic of the week. We also celebrate the joy of science fiction through community collaborations such as our current Rite of Passage project, in which we are partnering with local media companies to produce the first ever full-length African American alternate history film. This project enables Georgia Tech students, staff, and faculty members to get involved in every aspect of independent filmmaking, from fund raising and location scouting to costume design and acting. Taken together, these research, teaching, and production activities illustrate how we here at Georgia Tech are realizing Hugo Gernsback's dream of using science fiction to build a happier, more equitable, and more enlightened world.

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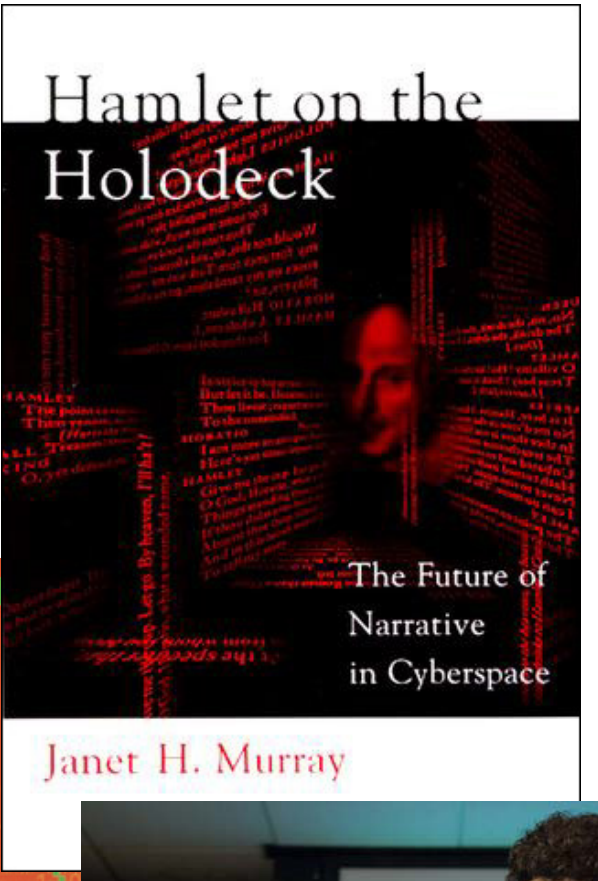
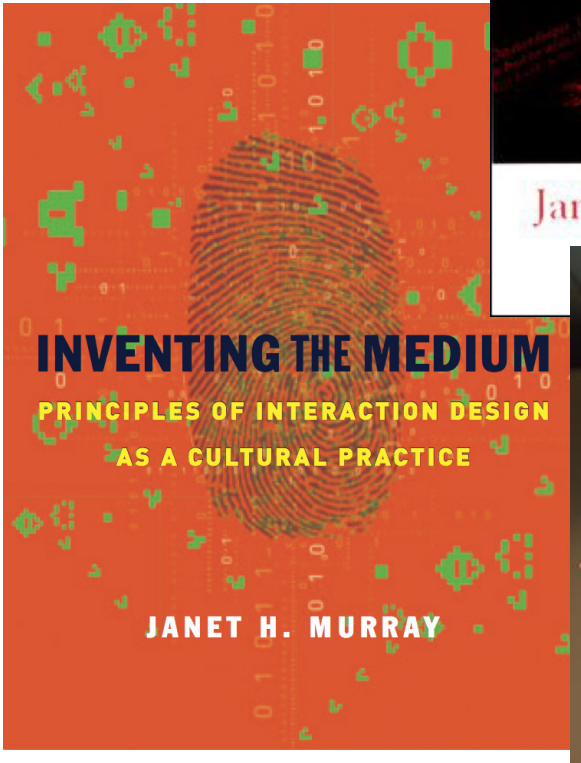

Hamlet on the Holodeck
The Future of Narrative in Cyberspace
Janet H. Murray


INVENTING THE MEDIUM
PRINCIPLES OF INTERACTION DESIGN AS A CULTURAL PRACTICE
JANET H. MURRAY

Janet Murray

Inventing the Medium: The Radical Challenge of Humanistic Digital Design

We live at an extraordinary time in human history when a new medium of representation has come into our hands. This has happened before—most spectacularly in the unrecorded moment when our early human ancestors invented spoken language, and again with the invention of drawing, writing, printing, photography, and the diverse electronic recording and transmitting media of the past two centuries: the telegraph, telephone, movies, radio, and television. The computer, like all of these media, is a means of focusing shared attention by establishing conventions for capturing information in a commonly shared code and moving it across time and space. And like earlier media, it is transformative because of its augmentation of our powers to share our thoughts and coordinate our behaviors.

As a humanist trained in the history of the novel, I was drawn to the then nameless profession of interaction design when I was teaching at MIT in the early 1980s and my students showed me the first interactive narrative artifacts ever made—a text-based conversation named Eliza that responded like a therapist by echoing keywords taken from the user's input ("Tell me more about your mother.") and a text-based adventure game called Zork that put the player in a navigable maze with trolls and treasures ("A passage leads to the west and a dark staircase can be seen leading upward"). I had learned programming working for IBM between college and graduate school and so I understood how these interactive stories could be made of computer code. I realized from studying the development of the English novel that expressive new conventions of storytelling could grow over time within a tradition of practice. It was exciting to me that my students and I could help to build this tradition of practice by making narratives out of code. And as a humanist I also wanted to describe the tradition, to write books and articles about it as well as to make artifacts. Since the 1980s, I have seen both practices grow and cross-fertilize one another: the design work of inventing new expressive and informational digital genres, and the analytical work of describing these new artifacts as part of larger cultural practices.

The boundary between videogames and stories has proven to be a particularly fertile expanse, with many kinds of practitioners, some more literary and text-based, some more cinematic, some more mainstream

and formulaic, some more independent and idiosyncratic. Humanistic discourse has had to expand just as it did with the advent of film to consider games as complex cultural forms worthy of analysis. Designers have welcomed this discourse as a source of vocabulary for describing what they do, helping them to articulate their aesthetics, and to identify ways to do it better.

Faculty and students in Digital Media at Georgia Tech occupy a privileged position as both theorists and practitioners of digital design. As humanistic designers, we are driven not by the novelty of the technology, but the unexplored possibilities for making meaning. For me, the most enticing possibilities lie in the structures we can create for more complex storytelling. Television is a particularly rich source of narrative design problems. Digital transmission has opened up the possibility of long-form storytelling, since audiences can view whole seasons after their original broadcast date, and they can follow story over multiple seasons. This is leading to greater consistency and ambition in storytelling, but it is also confusing to audiences, which opens up productive opportunities for interaction design.

Why create aids for watching TV shows? Storytelling is one of the oldest human activities, a means of sharing our understanding of the world, creating cultural affiliations and identities, testing our moral judgments, and expanding our capacity for empathy. Structures that help us to tell and to receive more complex stories hold the promise of expanding human potential. Of course, that potential can be used for constructive or destructive purposes. For me, as a child of the enlightenment with a faith in human reason and the democratization of knowledge, and as an educator within the problem-solving atmosphere of an Institute of Technology, I lean to the optimistic view.

Working in a field that has brought such radical change to social practices and revenue streams, I have often been confronted by panicking professionals including print journalists, broadcast news

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producers, heads of movie studies, publishers, librarians, Shakespeare scholars, and deans of universities, all of whom have good reason to worry about how changes in the inscription and transmission and information will affect their job security and the future of their institutions. My response to this very real anxiety is always the same: Consider the core function of what you are doing and focus on preserving and expanding that, rather than fetishizing the current media formats. This is also the first step in the radically constructive design process that I teach my students in the core course in interaction design. It comes from the humanistic stance of stepping back from the current moment and to look at the situation within the longer view of human culture. The answer to "what will become of us in the digital age if newspapers or books or television networks suddenly disappear?" is to identify the longer history of the activity, to retrace how it took the shape it currently has, and to try to see what value it has independent of particular media objects. A newspaper or TV news show is valuable because professional journalism is valuable with or without the current methods of segmenting and transmitting it. The question is not how do we preserve legacy formats, but how do we expand the journalistic enterprise by harnessing the powerful expressive affordances of the digital medium?

As an educator in a rapidly changing field I have a responsibility to train students with methods that will last them over their career. Humanistic design methods offer the best framework for that approach, in my view, by providing us with a radical perspective that can turn the threat of digital disruption into the opportunity for creative invention and renewal.

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“Yesterday’s scientist and engineer was a technician, frequently operating in the technical vacuum of their discipline. The 21st Century scientist and engineer have a ‘renaissance’ education able to use their technical knowledge to improve the human condition, affect change of policy and practice, and communicate complex problems and solutions. As we develop the next generation of leaders who have a broad and deep understanding of the world around them, ‘One Georgia Tech’ will describe our education—bringing diverse perspectives together in order to instill a critical set of skills in analysis and application. The inter- and cross-disciplinary nature of the School of Literature, Media, & Communication is an exemplar of the unique perspective on technology and its broader implications on human behavior, ethics, and society.”

Rafael L. Bras,
K. Harrison Brown Family Chair and Professor,
School of Civil and Environmental Engineering

Nihad Farooq

On Slavery and Social Networks

In January 2011, despite the Egyptian government's attempt to establish a communications blocade, thousands of young Egyptians blanketed the streets nationwide, demanding an end to Hosni Mubarak's 30-year rule. Journalists and social media theorists have highlighted the significant role played by Facebook, Twitter, and blogs in contributing to the diffuse yet organized nature of these protests; the use of social media enabled an unprecedented number of separate demonstrations to occur simultaneously on what was dubbed beforehand—in online posts and tweets—as an upcoming "day of wrath."

The Arab Spring, however, is not the first revolution driven by social networks; in the Americas, especially within the complex structure of New World slavery, the power of social networks to achieve such momentum has a long history and a vast geographical terrain, from Virginia to Trinidad, from Veracruz to Antigua, and beyond. We can look back, for example, to the German Coast Uprising of January 1811, in which slaves spread word of a planned revolt among hundreds of their peers at plantations up and down the east coast of the Mississippi. Although Charles Deslondes is often credited as the hero of the uprising, historians have now pointed to as many as 11 separate leaders, representing various ethnic groups, and a vast network of communication that extended back through the Caribbean.

In my research and teaching here at Georgia Tech, I encourage my students to think about how we can use our contemporary understandings of technology and its various functions to better understand the political and cultural work of literature across a broad span of history. How might we use our postmodern understandings of virtual worlds, disembodied selves, and global connectivity to help us visualize and imagine the perpetual movement of cultures across time and space, through the diffuse circulation and exchange of languages, experiences, epistemologies, and traditions?

My own research on slavery and social networks, for example, examines the ways in which earlier acts of social and political resistance thwarted narratives of origin and traceability in the same way that some of today's resistance networks do, even as they rely on hierarchical structures and institutions to (sometimes surreptitiously) achieve their aims. By linking contemporary network theory to historical and contemporary acts of political resistance and community formation, I employ a humanistic lens that is necessarily technological. I ask students to consider how virtual networks, like those that have inspired or tracked contempo-

rary democratization movements in Tunisia, Cairo, and Iran (a.k.a., the 'Twitter Revolution') transform the logic of destabilization and chaos that guides network theory, into a seamless structure of movement and action. How might a reexamination of slave resistance and slave narratives through this critical-technological lens, for example, further our understanding of the evolution of social networks and political mobilization across different geographies and historical periods? What might we learn from the kinship ties forged in these early American spaces and the narratives of flight and survival they inspired? How does the contemporary virtual community borrow from this unique history of constructed kinship, and how might such a link help us reconsider nationalism, democracy, and family in the twenty-first century?

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Slave rebels of 1811, then, have much to teach us about the kinds of social networks that enabled and inspired the protests of 2011. Hemmed in by a social structure that has been historically focused on the problems of alienation, discontinuity, and the dissolution of 'natural' categories of kinship, slave communities (whose formation and persistence—in the face of great odds—is in itself an act of rebellion) might actually offer contemporary readers new insight into the convergence, the function, and the power of diffuse social and political networks throughout history. For as slave ships made the same journeys and marked the same patterns of travel across and back through Atlantic ports, as family and community members heard information—even misinformation—about their kin adrift in the New World, and as new patterns of kinship were formed, based on common struggle and common cause, a new kind of network collectivity emerged. This new collectivity was not tied to the traditional organizations of geography nor biology nor national affiliation, but, like today's global internet, was a collectivity that emerged and strengthened precisely because of its lack of boundaries, traceable origin, or kin—anonymity and alienation became acts of strategic camouflage: Because they were suddenly nowhere and no one, they could use information to be anyone anywhere—a collective action united against oppression.

By locating my study of eighteenth- and nineteenth-century slave networks within a contemporary discourse of social network theory (particularly recent scholarship that discusses the global internet as a space of queer or creolized networks),

I am able to help students think outside traditional paradigms of community, national, and familial organization. Just as contemporary social media prioritizes overlapping functions and strategic alliances above traditional kinship ties, so many slave networks generally functioned and were organized—by necessity—outside traditional paradigms of family, home, and national allegiance. The diverse community of strangers in the New World who organized plots and created a vast network of information mirrors the organizational structure of the global internet. But while we often pathologize these kinds of networks in our contemporary era (i.e., terrorist cells, disease outbreaks), a backward glance at slave networks reveals the politically progressive implications of loose ties and networked mobilities for inciting democratic social movements, such as the abolition of slavery and the collapse of dictatorial regimes.

My research and pedagogical investments are thus inherently interdisciplinary and rooted in the technological, as I work from the premise that race—as a diasporic, performative, and infinitely mobile act—is itself a technology, and one that is central, not peripheral, to understanding how communities and nations are made and unmade. The emergence, survival, and the spread of community networks are forged by these mobile and mobilizing racial alliances, and backed, of course, by a shared desire for freedom that was strategically, if not ideologically, parallel to the founding propositions of New World settlement.

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Krystina Madej

History of Narrative as Material Practice: Interpreting Communication Technologies

Frame of Reference:
History lets us put a subject in a broader context, giving it depth, and us perspective. When we know how communication media have been used in the past, we gain both objectivity about the way they are used today and an intimation of how they may be put to use in the future. Without knowledge of history, our world is both small and beyond our understanding.

Narrative is implicit in the practice of communication. Whether orally, visually (text, image), or digitally (static, moving, interactive), we share and exchange information through stories. Without stories we cannot link facts, make them our own, and dialogue with others to share our ideas.

Material practice refers to the making and use of material culture, or, the artifact. For narrative this takes us from the first images on cave walls 40,000 years ago to today's tweets on mobile phones. Material practice attends to and is concordant with culture; it underlines that material things are not isolated objects; they have agency and they structure behavior.

Narrative
In both 2001 and 2003 the Smithsonian Institute hosted conferences on "Storytelling: Passport to the 21st Century" including speakers such as John Seely Brown, Chief Scientist at Xerox, Larry Prusak, Executive Director of the IBM Institute of Knowledge, and Steve Dinning, former director of Knowledge Management at the World Bank. The conference highlighted the use of narrative to achieve practical outcomes. Conference speakers explored storytelling and suggested it would become a key component of "managing communications, education, training, and innovation" in the new century. This conference envisioned a new world order and value for narrative. When Dinning had first explored the possibilities of using narrative in business, however, as he tells us in *The Springboard: How Storytelling Ignites Action in Knowledge-Era Organizations* (2012, p. xv), the reality exposed a different perspective:

I quickly found I was living in an age when storytelling was suspect. Scientists derided it. Philosophers threatened to censor it. Logicians had difficulty in depicting it. Management theorists generally ignored it. And storytelling's bad press was not new. It had been disreputable for several millennia, ever since Plato identified poets and storytellers as dangerous fellows who put unreliable knowledge in the heads of children and hence would be subject to strict censorship in The Republic.

Why Such Suspicion?

Our society espouses the scientific method as the best way of knowing. The rationalism (logic) of the Greeks and the empiricism (direct observation, recording and monitoring of the world) of the seventeenth and eighteenth century are two identifiable and dominant aspects of the scientific tradition. This rational-empirical approach came to characterize scientific inquiry and was adopted for the study of society in the nineteenth century by the French philosopher August Comte. Comte believed society could be studied scientifically and understood objectively through observation in a logical and rational manner rather than through religion and metaphysics. He called this scientific approach "positivism." The positivist view has been challenged over the centuries by "relativists" who argue that there is no final truth about which we can all agree. Theories of how we know have changed over the years to include the value of perception, dialectics, and mysticism, among others. Yet the belief that there is an objective world which can be known, and known objectively (objectivism), and the authority of the scientific method, still characterize our own time and many of our research communities.

Narrative Turn

During the first half of the nineteenth century a "Linguistic Turn" occurred in the fields of philosophy, the humanities, and the social sciences that had its beginning in the theories of the Swiss linguist Ferdinand de Saussure. Saussure centered his research on the underlying system of language, in the vein of scientific analysis, rather than the use of language. The structuralist movement looked to explore the relationships between elements (such as linguistic signs) and in doing so uncovered basic social-psychological tasks/events that are part of peoples' lives everywhere. When they deconstructed meaning in narrative and codified ideas they took narrative out of its normal context and showed that as a semiotic phenomenon it can transcend disciplines and media.

Critics of the early structuralist movement, such as Gerard Genette, saw its scientific approach as pretension and felt the movement was being degraded to mindless technicalness. They argued against objectivity and for the influence of cultural context. Meaning, then, in narrative became inseparable from the context of human action with stories linking actions and events into a whole and providing for their significance. Narrative has slowly become recognized as a cognitive style and discourse genre that people can use to understand their lives and has been espoused by fields of study as diverse as education, family therapy, health sciences, and business.

History, however, shows us that the use of narrative in these fields, as well as in the hard sciences, has been common since writing began. With each new generation, and adapting every media that has been developed to its purpose, narrative has been

used to present, explain, and instruct on thoughts, ideas and theories, whether those of Sophocles, Shakespeare, or P.D. James, or Euclid, Alberti, or Einstein. In adopting media as a material culture, narrative gains cultural agency and excerpts the additional power of contemporary relevance to achieve its end.

Material Culture

Humans construct their knowledge of the world as schemata, as short bits of story that, with time, build towards a narrative intelligence, a perspective from which they view the world. Since the days of drawing on cave walls humans have used not only their voice and their gestures to share their narratives, but have put to use the materials within their grasp to give their stories material presence. While to us the historic objects we find and examine may seemed fixed, when they were created they were only in the process of becoming, part of a continuously evolving effort to express, with each subsequent generation actualizing a new material culture through which its stories represented their thoughts and deeds. In our presentation of narratives in digital media, we continue that process of becoming far more rapidly than in the past: each creation is quickly overwhelmed by new manifestations as we move forward eagerly and respond with alacrity to the changes in our media.

How then do we interpret the material culture of narrative? Can we look at the artifact left behind objectively, comparing it to contemporary ways of telling stories? Will it fall short in some way, and be shown up as backward?

Hardly.

When introduced to the history of narrative as material culture, *students learn for themselves* that humans have the uncanny ability to make the best of what they have at hand to share their stories: not just to respond to a medium but to use it innovatively and cause its continuous evolution. There is a give and take that goes on, a creation of more than "a story in the ether," the creation also of a material object that is grounded in the culture around it and which reflects that culture intimately. Content, form and function, and media affordability, as each era has configured this triumvirate, are the material culture of narrative used to collect, preserve, and communicate our constructs of the world.

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THE COLBERT REPORT
Ian Bogost
Author, Persuasive Games

Ian Bogost

Understanding the "Experience" of Objects

To understand the nature of the universe, let's accept two new principles: first, everything whatsoever is alien to everything else. And second, the experience of a thing can never be verified or validated, but only speculated, even if through deduction. In addition to science and philosophy, we need poetry too.

We usually understand "alien" either in a political or a cosmological sense: a terrestrial alien is a foreigner from another country, and an extraterrestrial alien is a foreigner from another planet. Even when used to refer generally to otherness, we assume that aliens would be legible to humans. Whether from another nation or another galaxy, the other is someone we can recognize as enough like ourselves to be identifiable.

But why should we be so self-centered as to think that aliens are those beings like us? As Nicholas Rescher has observed, a true alien might not even have an intelligence akin to our intelligence. Rather than wondering if alien beings exist in the cosmos, let's assume that they are all around us, everywhere, at all scales: dogs and penguins and magnolia trees; cornbread and polyester and Orlando. Then we can ask a different question: what do objects experience? What is it like to be a thing?

I came to this question by accident. Several years ago, I learned how to program the 1977 Atari Video Computer System, the console that made home videogame play popular. I was working on a book about the influence of the Atari's hardware design on creative practices in those early days of the videogame.

To produce television graphics and sound on the cheap, Atari designed a custom chip called the Television Interface Adapter (TIA). The TIA made bizarre demands on game makers: instead of preparing a whole television picture all at once, the programmer had to alter data the TIA transmitted in tandem with the scan-line-by-scanline movement of the television's electron beam. Programming the Atari feels more like plowing a field than like painting a picture.

You can see the effects of the TIA's line-by-line logic in Atari games: the rows of targets in *Air-Sea Battle* or the horizontal bars of horizon in *Barnstorming*. But I felt enchanted by the system's parts as much as

In addition to science and philosophy, we need poetry too.

its output. The Atari was made by people in order to entertain other people, and in that sense it's just a machine. But a machine and its components are also something more, something alive, almost. I found myself asking, what is it like to be an Atari or a cathode ray tube television?

Such a question may seem far-fetched. But is it really so strange to ponder the experience of objects, even while knowing that those objects don't really have experiences like our own? To be fascinated with the things, from peach pies to microprocessors, and to embrace such fascination as philosophers as much as engineers? To do so, we must culture a new alliance between science and philosophy grounded in speculation.

From a common origin in Enlightenment rationalism, human culture spread in two different directions. On the one hand, science broke down the biological, physical, and cosmological world into smaller and smaller bits in order to understand it. On the other hand, philosophy concluded that reason could not explain the objects of experience but only describe experience itself. One extreme led to scientism, the belief that we can know the world completely by taking it apart, the other to relativism, the belief that we can never escape the mind, and that the world conforms to thought, language, and culture.

Despite this split, for the last four centuries science and philosophy have ultimately agreed on one fundamental principle: humanity is the ruler of being.

Science embraces the Copernican decentering of human beings, but it also assumes that the world exists for the benefit of humankind. Animals and

For its part, the humanities have revealed the diversity of human experience, but only by straining all of reality through the sieve of culture.

plants too, perhaps, but certainly not toasters or Television Interface Adapters.

For its part, the humanities have revealed the diversity of human experience, but only by straining all of reality through the sieve of culture. Religion, politics, science, and engineering become expressions of human will or ideology, and reality becomes a myth. In its place, semiotics and society were crowned the rulers of existence.

The philosopher Graham Harman has given the names "undermining" and "overmining" to these two positions. Underminers focus on firmament, be they quarks, DNA, or mathematics. Things like sheep and battleships become tricks that deceive minds too naive to understand their depths. Overminers take objects as less real than the processes and circumstances that produce them. There are overmining and undermining sciences and philosophies alike, but generally speaking the sciences have a tendency to undermine while the humanities have a tendency to overmine.

Instead, what if we took all things as equal—not in value, but equal in existence? If ontology is the branch of philosophy that deals with the nature of being, then we need a flat ontology, an account of existence that takes nothing to be more or less extant than anything else.

Why hold such a position? The philosopher Thomas Nagel famously pondered what it is like to be a bat, concluding that the creature's experience could not be reduced to a scientific description of its method of echolocation. Science believes it can answer any questions through observation and verification. But despite our obsession with scientific answers, the experience of alien objects cannot be explained through experimentation.

The same is true of everything—not just bats, but also Atari Video Computer Systems. It is not enough to ponder the role things play in human enterprise, nor to limit empathy to living creatures such as dogs and forests. Once everything is on the ontological table, human choices become more complex. Grand challenges like health, energy, climate, education, and poverty can no longer be addressed as problems for humans alone. The world is not just ours, nor is it just for us. Existence is for microprocessors or petrol derricks as much as for kittens or bamboo.

A new humility and earnestness might emerge from this metaphysics, one that embraces science and humanism while acknowledging the limits of both. Instead of a world of knowledge or progress, let's instead imagine a world in which everything possesses as rich and fascinating an existence as anything else. Characterizing that existence requires a new breed of philosopher-engineer-poets who would observe the operation of things while recognizing that any description of their experience will always remain metaphorical.


poetry

Ilya Kaminsky

Technicians of the Sacred

"Poem is a small (or large) machine made of words." William Carlos Williams famously stated. But doesn't a poem make us feel, doesn't it rip open our senses, open up windows to the larger world? Didn't Lorca famously tell us that poet is a professor of five senses? Didn't Wordsworth insist that "poetry is a spontaneous overflow of powerful feelings"? Didn't Lucille Clifton tell us that poetry began when someone walked off a savanna or out of a cave and looked up at the sky with wonder and said, "Ah-h-h."

So, how do these opposites co-exist?

Where does emotion and the technology of language combine to create an art?

These questions are as old as the art itself.

And, these are precisely the questions our students at Georgia Tech tend to ask.

If prose is best words then poetry is best words in their best order, Coleridge told us, poetry is best words in their best order. Poetry, Thomas Hardy echoed, is emotion put into measure. The emotion must come spontaneously, but measure can be acquired by technical mastery. Poetry, Robert Frost repeated, is when an emotion has found its thought and thought has found its proper words. Poet, Jerome Rothenberg echoed, is a *technician* of the sacred.

*

First and foremost in our poetry classrooms at Georgia Tech we learn how poems are *made*. If a poem is a machine, it has parts that are interchangeable; its form is replicable, though its product (emotion, in this example) may vary. Here's an example of how three poets used the same mechanism (anaphora, or the repetition of words at the beginning of the poetic line) to create three different emotional registers: authoritative, elegiac, and romantic.

Here are well known lines from *Ecclesiastes*, King James translation:

To everything there is a season.
And a time to every purpose under the heaven
A time to be born, and a time to die;

A time to plant, and a time to pluck that which is planted;
A time to kill, and a time to heal;
A time to break down, and a time to build up;
A time to weep, and a time to laugh;
A time to mourn, and a time to dance;
A time to cast away stones, and a time to gather stones together;
A time to embrace, and a time to refrain from embracing;
A time to get, and a time to lose;
A time to keep, and a time to cast away;
A time to rend, and a time to sew;
A time to keep silence, and a time to speak;
A time to love, and a time to hate;
A time of war, and a time of peace.

As we read this, we are aware that in the Bible, the narrator of these verses speaks in a voice of authority to the community; the voice is declarative, it pronounces wisdom at us. But look what happens when the same chant, the same repetition of time is used by the Polish poet Tymoteusz Karpowiczm who borrows this device of anaphorical repetition and "list poem" format to make a kind of "survival" chant in mid 1940s, post-World War Two landscape. He calls his poem after the "author" of the above text, *Ecclesiastes:*

Ecclesiastes

there is a time of opening the eyes and closing the bed
time for donning a shirt and shedding sleep
time for drowsy soap and half-awakened skin
time for the hair-brush and for the sparks in the hair
time for trouser-legs, time for shoe-laces time for buttons
for laddered stockings for the slipper's blindness
time for the fork and for the knife time for sausages and boiled eggs
time for the tram time for the conductress time for the policeman
time for good morning and time for goodbye
time for carrots peas and parsley
for tomato soup and shepherd's pie
time for trussing chicken and releasing forbidden speeds for thought
time for cinema ticket or a ticket to nowhere
to a river perhaps perhaps a cloud
there is finally a time for closed eyelids and the open bed
time for past present and future

praesens historicum and plusquamperfectum
time perfect and imperfect
time from wall to wall

We see right away that Karpowicz announces his intent to take something from the older text: he borrows the technology of anaphoric repetition. But his images and use of detail give a new kind of emotion to the canonical litany; it is transformed. This onslaught of detail in Karpowicz's version—a cinema ticket, tomato soup, sausages, a hairbrush—makes us smile, but we also shudder at its own metaphysics: it is homelier in comparison to the Ecclesiastical narrator's grand proclamations, and yet more terrifying. Writing in Europe ravaged by war, having witnessed the bombardments of cities, the camps, Karpowicz's tone is both ironic and tender; his response is multilingual, multivocal, it refuses to console, and yet consoles. It bombards the canonical form with detail, and yet allows it to enter into our world, gives it urgency of this moment.

"Time for cinema ticket or a ticket to nowhere / to a river perhaps perhaps a cloud" says Karpowicz, and the reader perhaps thinks of the camps. This is how the poet uses the technology of language in a new way, updates it with the new tonalities, new images that get us a very different kind of emotion.

An entirely different kind of emotion arises when the poet Paul Celan adopts some elements of this technology for an affecting love poem:

Corona

Autumn eats its leaf out of my hand: we are friends.
From the nuts we shell time and we teach it to walk:
then time returns to the shell.

In the mirror it's Sunday,
in dream there is room for sleeping,
our mouths speak the truth.

My eye moves down to the sex of my loved one:
we look at each other,
we exchange dark words,
we love each other like poppy and recollection,
we sleep like wine in the conches,
like the sea in the moon's blood ray.
We stand by the window embracing, and people look up from
the street:

it is time they knew!
It is time the stone made an effort to flower,
time unrest had a beating heart.
It is time it were time.
It is time.

Celan's poem is a very private, personal address. "It is time they knew!" Celan exclaims, as his repetition of "time"—this correspondence— in the last five lines of the poem echoes the old canonical text, giving it a chance to enter a twentieth-century love lyric. If the speaker is addressing the public (as in *Ecclesiaste*s), it is by standing with his lover by the window, embracing.

Yes, the poem is perhaps a machine made out of words. Yet what kind of emotion drives the words determines where we are going. And poetry is a kind of art that provides us with an open road.

Doesn't a poem make us feel, doesn't it rip open our senses, open up windows to the larger world? Didn't Lorca famously tell us that poet is a professor of five senses? Didn't Wordsworth insist that "poetry is a spontaneous overflow of powerful feelings?" Didn't Lucille Clifton tell us that poetry began when someone walked off a savanna or out of a cave and looked up at the sky with wonder and said, "Ah-h-h."

Carol Colatrella

On Narrative

LMC's tag line "humanistic perspectives on a technological world" offers an expansive promise to inspire students and faculty. As a humanist with interdisciplinary degrees (liberal arts and comparative literature), I have tried to live up to this claim by developing courses at Georgia Tech that encourage students to understand connections between the liberal arts and STEM fields and to develop technical expertise in literary and cultural study. My scholarship and teaching focus on social equity issues illustrated in post-Romantic (i.e., Shelley's *Frankenstein* and after) narratives that represent scientific and technological concepts. My syllabi include fictions, films, on-line videos, and advertisements, and our class discussions concentrate on figuring out and responding to the social commentary and cultural values embedded in these narrative texts. My literature and film courses have focused on race as a theme in works by African-American and white women writers; issues of authority, transgression, and adaptation in Herman Melville's fictions; and class conflict in recent British films. Courses in gender studies look at sociological, literary, historical, and medical accounts of femininity and masculinity and consider how gender matters in shaping personal views and public policy. Students develop skills in analyzing narratives and ideologies that they can apply to study and work in a range of academic fields and to their everyday experiences. The approach taken is that of "cultural study of narrative," which focuses attention on written, visual, and non-verbal discourse.

What is "narrative"?

In the past century there has been an explosion of interest in studying narrative forms and in establishing robust theories of narrative that apply across disciplines, media, and cultures. Porter Abbott (2008) offers a succinct and commonsense definition that privileges plot: "As soon as we follow a subject with a verb, there is a good chance we are engaged in narrative discourse." Gerald Prince (2003) acknowledges the mixed rhetorical modes of narrative in his definition: "Narrative is a discourse representing one or more events. Narration is traditionally distinguished from description and from commentary but usually incorporates them within itself."

French theorist Roland Barthes's essay "Introduction to the Structural Analysis of Narrative" initiated interest in applying techniques used to study literary texts to cultural texts in claiming "The narratives of the world are numberless. . . . Moreover, under this almost infinite diversity of forms, narrative is present in every age, in every place, in every society; it begins with the very history of mankind and there nowhere is nor has been a people without narrative. All classes, all human groups, have their narratives, enjoyment

of which is very often shared by men with different, even opposing, cultural backgrounds. Caring nothing for the division between good and bad literature, narrative is international, transhistorical, transcultural: it is simply there, like life itself."

Barthes's description of narrative is the most expansive and exciting in connecting cultural activities to textual accounts of such experiences and doing so across time, space, and other boundaries. To study narrative is to study human existence, to better understand who we are, but it is also a way of characterizing other forms of existence. For example, fictions such as *Gulliver's Travels* and *Black Beauty* provide accounts of animal consciousness. Science fictions offer opportunities to analyze aliens, monsters, and zombies, characters that may or may not be versions of us.

There are many reasons to study narrative. We think and remember in stories. We learn about how things work and how to make them by means of following and developing procedures, which are causal narratives. We communicate and establish relationships by sharing stories (jokes, anecdotes, visual narratives, histories). We like to hear, read, view, and act out stories and to write narratives.

The study of narrative encompasses a number of disciplines and related topics, including

- Literature: genres, conventions, representations
- Television and cinema: fictional and documentary structures
- Media: analog and digital forms (games and other objects)
- Communication: discourse and audience
- Graphic arts: comics, painting, sculpture, prints
- Psychology/Cognitive Science: how we think and understand, what we remember
- Advertising/Marketing: how to persuade others
- History: narratives of human events and traditions
- Cultural Studies: human values and relations

Studying narrative and narrative theory enhances a student's capabilities. Reading and writing about texts increases one's understanding of how narrative discourse has been constructed and adapted over time and of how different socio-political interests prevail in narrative form. Doing so also improves one's understanding of how cultures and organizations work and enables one to be a better thinker, reader, writer, and communicator. Understanding narrative makes one into a more interesting human being.

Studying narrative makes one powerful. As film director Brian De Palma argues, "People don't see the world before their eyes until it's put in a narrative mode." Being familiar with narrative structures and strategies increases one's capacity to discern ideologies of power influencing interpretation. Analyzing texts includes considering both author and reader, for, as feminist literary theorist Susan Lanser notes, "Feminist critique of the masculinist bias. . . has . . . taken the view that theory sometimes says more about the reader than about the text."

The study of narrative can be the foundation for many career paths. Fields that value understanding narrative include

- Creative writing, technical communication, web and graphic design, journalism, marketing
- Working in television, film, social media, game, Internet, and other companies
- Teaching literature, media, communication,

cultural studies, design

- Pursuing study/practice in law, public health, medicine, business

In short, reading, discussing, and writing about narratives prepares one for work, relationships, and political engagement. Understanding the dynamics of a fictional world, as one does when one reads a novel or sees a film, and teasing out the logical contradictions of an attempt to persuade, as one does when viewing a print or television advertisement or hearing a political speech, are skills that one uses every day.

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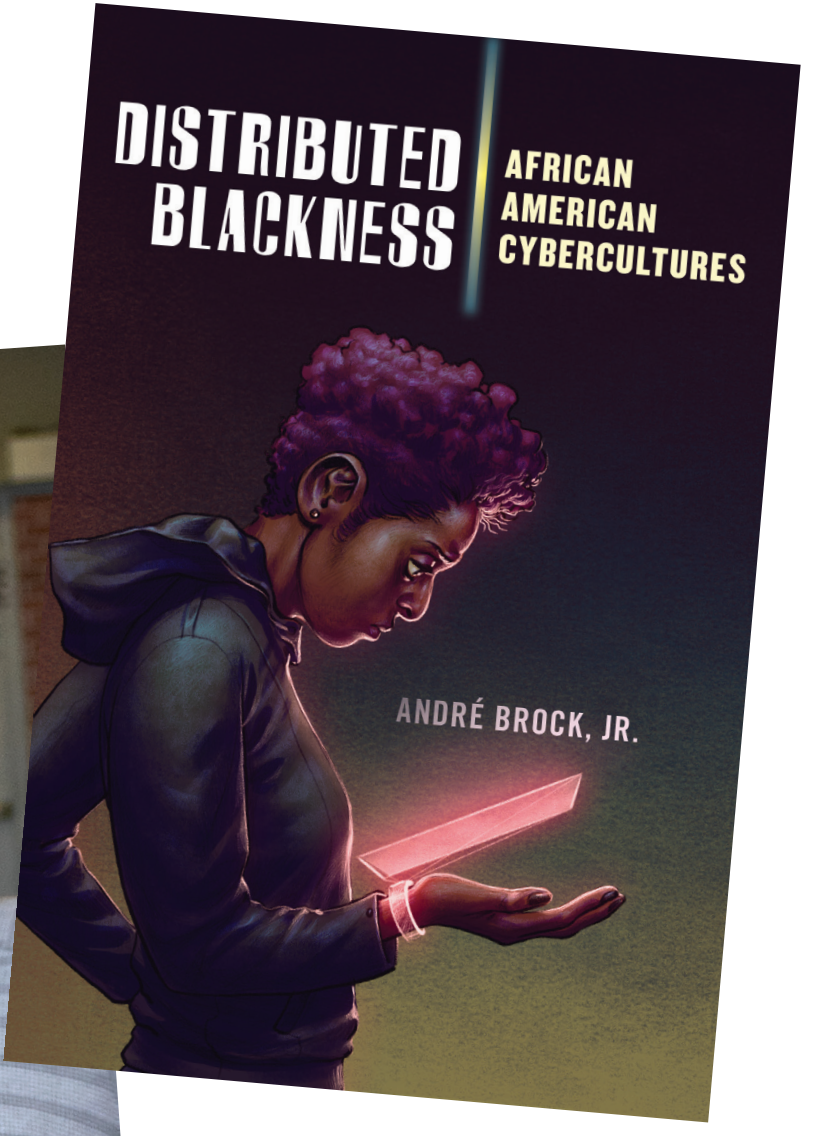
DISTRIBUTED BLACKNESS
AFRICAN AMERICAN CYBERCULTURES
ANDRÉ BROCK, JR.

André Brock


thot leedurr @DocDre · 18s
although i'm on The Bird all the time, i never compose tweets in advance.
Nevertheless, being faculty @georgiatech's School of Literature, Media,
and Communication has been amazing. Smart thinkers, great students,
and ATLANTA.
1
thot leedurr
@DocDre
Replying to @DocDre @ed_saber and 7 others
I just published a book on Black cyberculture: Distributed
Blackness. My work directly connects to ethics and CS
because many of tech's problems are due to their
uninterrogated beliefs about technology users. 2/2

“Whether via print media or our personal devices and computers; society is strung together through engagement with images (video/film, art & design) and the written word. Our students develop the media arts skills needed to responsibly communicate with the public rooted in theory, critique, analysis, science, and technology. We develop students into impactful creators who are poised to grow and adapt alongside evolving technologies.”

Jillann Hertel,
MFA, Creative Director,
LMC Career Origination Lab (co-lab)

David Young

Engineering Associations: Connecting the Associative Work of Engineering and Rhetoric

How do we define the act of engineering? More importantly, where does our definition come from? We could draw upon disciplinary knowledge boundaries to distinguish electrical from chemical engineering or chemical engineering from chemistry, but to engineer is more than one's understanding of laminar flow or Kirchoff's circuit laws. To engineer is to associate (i.e. to construct, deconstruct, and maintain intricate networks of interaction). When emphasizing the doing of engineering, we see its associative nature more clearly and create pathways for interdisciplinary collaboration between the humanities and the sciences. My own emphasis on engineering as associative comes from studying the rhetorical practices of engineers in situ as they engage in their routine work. If engineering is to associate, therein lies the entry point for rhetoric as an essential component of engineering work. Rhetoric is not mapped on after a thing has been engineered, it is present throughout the act of engineering.

Rhetoric is no longer limited to interpretation, criticism, or *a posteriori* concerns of intention in discourse, but is expanded to include how rhetoric intermingles with other dimensions of human activity. Rhetoric (and technical communication) prioritize association throughout these intricate networks of activity to provide more complete understanding of communicative practices. With this conception of rhetoric, we also situate rhetoric firmly in engineering activity, in discussing its successes and its failures. As a technical communication scholar, I seek to embody this interdisciplinary thinking by blurring the boundaries between the multi-faceted activities of engineering work.

Since the inception of post-secondary engineering education, we have tended to bifurcate rhetoric and science for students. To argue for technical communication and rhetoric as fields worthy of study separate from engineering, scholars have worked to demarcate their boundaries and reify the disciplinary knowledge housed within. Though this work has led to the proliferation of technical communication in both academia and industry, it has also reified an existing boundary between technical and non-technical work. Even when we include technical communication within the engineering classroom, research shows that students still see technical communication as distinct from their engineering work. A more beneficial approach is to situate disciplinary enculturation within the activity of engineering as seen in routine work.

In the doing of engineering, no bifurcation exists. Those working in engineering are simultaneously technical communicators and engineers. Framing translation and application of their engineering knowledge becomes the focal point of engineering activity once an engineer enters the workplace. Separating technical communication and engineering throughout disciplinary training continually reinforces the boundaries of their implementation. Throughout their routine work, engineers must coordinate their own technical knowledge, experiences, and backgrounds within their workplace networks. Navigating these networks inherently requires rhetorical training and expertise as well as the technical training typical of engineering education.

As a researcher, I seek promote collaborations between the humanities and engineering by studying the activity of engineering in the workplace. This data then establishes the exigencies for adapting rhetorical training in ways that are beneficial for future engineers. Ethnographically studying the routine work of engineers provides opportunities to further explore the rhetorical moments that profoundly affect their lives. The sooner educators can expose future engineers to these aspects of their work, the better prepared they will be to engage with and solve the world's foremost problems.

The engineer of this decade seems to implicitly understand the multiplicity of engineering work. It is technical. It is scientific. It is rhetorical. How then do we facilitate this understanding for the engineer of 2030? Of 2040? Understanding the activity of engineering is critical to this goal and we as humanities scholars must begin prioritizing our own interdisciplinarity as well. We should not do this from a colonizing approach that seeks to place our work as the foundation for all activity, but in a truly interdisciplinary sense that enrolls the agents working in these disciplines as co-researchers. In doing this, we create productive directions to advance our understanding of the humanities in technological spaces. We justify the importance of technical communication and rhetoric not as support for technical work, but to the doing of technical work.

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Humanities students also benefit from this approach. As a technical communicator, I seek to also prepare humanities students for their own work within technical spaces. For years, we have seen technical communication and rhetoric grow as disciplines, but in this growth, we have also attempted to strengthen the boundaries that house what we consider our knowledge. Studies that focus on activity or rhetoric in action show that technical communication treated as a practice (rather than a discipline) accommodates the dynamic nature of working in technical spaces. Of course, traditional rhetorical education is critical to the success of technical communicators; however, the modern technical communicator also requires an inherent understanding of the associative activity that this work requires. The technical communicator of 2040 should have expertise in strategically managing associations in the same ways that the engineer of 2040 manages engineering objects. Understanding this associative work will be my role in achieving this goal. As rhetoricians, we should continue to enter these technical spaces ethnomethodologically to understand the rhetoric that engineers use on a day-to-day basis. Only through this understanding can we hope to prepare those who will work at the future boundaries of the human-technology frontier. Entering these spaces affords us opportunities to define this activity while simultaneously redefining humanistic approaches to technology.

“If Georgia Tech’s mission is about improving the human condition, LMC’s role is to increase the humanity of the Georgia Tech community. LMC faculty and students continuously challenge us to seek and tell stories about ourselves, to speak truth to power, to examine technology in diverse cultural contexts, and to increase the ways we communicate in the digital world.”

Marlee Givens,
GT Librarian & Library Learning Consultant

Blake Leland

We're in the Money

Mid-20th century thinkers such as Harold Innis, Marshall McLuhan, Walter J. Ong, and Eric A. Havelock, immersed in a world of relatively new communication technologies (radio/TV/film), sought to understand the effects of these technologies by exploring an earlier, more fundamental shift in the technology or technique of communication—that is, the shift from orality to literacy, from a culture that could know only what it could remember and recite to a culture that could make long-lasting records of what it knew and thus free the human mind to apply itself to something more than recollection and repetition.

Others continued the work they began so that now, in the 21st century, it has become clear that the term "technology" may be applied more widely than it once was. It still names the world of big machines powered by wind, water, steam, oil, or electricity, but more and more it has come to mean technologies of information, representation, communication. One such technology—more ancient than writing, more ubiquitous than the smart phone—is money.

Money, money, money, money: we want it, we need it, we go to college (and justify the money spent) to learn how to make it. But what is it? The dictionary offers this: "…any objects or tokens regarded as a store of value and used as a medium of exchange." So, it would appear that money is a kind of media device for storing and exchanging a species of information we call value. This only opens up other questions: for example, what sort of "objects or tokens" serve, or have served, as money-media; what do we mean by "exchange," and what counts as "value"?

It seemed to me that in trying to come to some understanding of the significance and complexity of the money technology we would find ourselves working in a number of disciplines in addition to history and economics. We might touch on anthropology, sociology, philosophy, literature, psychology, aesthetics, computer science and more. A course along such multi-disciplinary lines would probably be out of place in most traditional academic departments, but because I teach in the School's Science Technology and Culture (STAC) program, I was able offer a class called "A Natural History of Money," confident that a multi-disciplinary exploration of this key human technology would help us to discover something of ourselves—and the Socratic injunction to "know thyself" is, after all, humanism's prime directive.

In the course of a semester we found ourselves thinking along with Marcel Mauss about money as it was manifested in ancient or "primitive" gift-economies, economies in which wealth was accumulated primarily in order to gain prestige and status by giving it away.

We examined a moment in Homer's *Iliad* in which the poet seems to misunderstand the gift-economy that motivates his heroes, a moment in which the relation between aristocratic values and rational, calculating exchange seems ambiguous or confused, and is, perhaps, a trace of an important historical transition between primitive and classical money-cultures, even as it may be also a trace of the transition from orality to literacy.

We visited the mercantile colonies of Greek Ionia, where the pre-Socratic philosopher Heraclitus saw in money a model for a kind of early, quasi-scientific conservation law—"Everything is an exchange for fire and fire for everything, as goods for gold and gold for goods."

We explored something of the history of interest, and of anti-Semitism, and of the relation between merchant and finance capital, by looking at parts of Dante's Inferno and reading Shakespeare's *Merchant of Venice*.

We pondered the relation of use-value and exchange-value by reading Ovid's account in *The Metamorphoses* of King Midas' golden touch, and compared that with Marx's account in *Das Kapital* and Adam Smith's in *The Wealth of Nations*.

We read Freud on money and then Norman O. Brown's psychoanalysis of the money-complex in the development of Protestantism.

We touched on the intricate relations of contemporary art and money by studying the work of J.S.G. Boggs, who produces unique handmade paper notes, buys goods and services with them, then sells the change and the receipt as works of art. Then we designed our own bills.

In a future iteration of this course we might one day study Isaac Newton's career as Master of the Mint, or think about the way monkeys use money in experimental situations, or consider the uses and future of the Bitcoin moneyform.

What is the take-away, the "pay off" of a course such as this? Well, at the very least we realize that, as the lyrics of the big opening number of the Warner Bros. depression-era movie *Gold Diggers* of 1933 tell us, "We're in the money." That is, the money technology, like every other technology, comes out of us and we are, therefore, always in some sense in it. To think about money (even while getting it and spending it) is to think about ourselves, to come to know ourselves. And it is to realize that every technology comes out of us; every technology is an expression of the vast creative capacity of human beings and is therefore an expression of our hopes and fears, our dreams and, sometimes, our nightmares. Technology is not merely something objectively given, something there. It is a kind of self-expression even as it is a tool for shaping and transforming our world and thus it is a matter for our moral and ethical considerations, as much as for our wonder. That, I think, is the point of a humanistic perspective on a technological world.

To think about money (even while getting it and spending it) is to think about ourselves, to come to know ourselves. And it is to realize that every technology comes out of us; every technology is an expression of the vast creative capacity of human beings and is therefore an expression of our hopes and fears, our dreams and, sometimes, our nightmares.

Susana Morris

The Work of Afrofuturist Feminism

My work as an Afrofuturist feminist is fundamentally concerned about what in our culture (re)imagines a Black future with Black folk—and Black women, in particular—actively centered and thriving. More specifically, my work at Georgia Tech seeks to illuminate black women's engagements with Afrofuturism and feminism as one particular way black futures are being reconceived and imagined. People of the African Diaspora are continuously creating culture and radically transforming visions of the future. And, certainly, Black people's futurist cultural productions offer a variety of futures—from portrayals that are optimistic, pessimistic, progressive, dystopian, or utopian. However, despite the variations in content, these visions are largely transgressive and subversive. For to be Black and not only envision yourself in the future but at the center of the future—to be the agent and subject of the future, and not relegated to the primeval past, used as props or pawns, or disappeared altogether—is an act of resistance and liberation, particularly in a present plagued by white supremacy and imperialism. And because Black women exist at the intersections of multiplicative oppressions yet remain producers of (often coopted) culture, their futurist renderings of architecture, art, digital media, film, literature, and music are often ignored, dismissed or diminished, but nevertheless remain fundamental to any complete understanding of futurity and practices of resistance. In my classrooms we discuss, analyze, and interrogate the works of scholars and creators like Ruha Benjamin, Beyonce, adrienne maree brown, Octavia E. Butler, Wanuri Kahiu, Tiffany King, Janelle Monae, Alondra Nelson, Safiya Umoja Noble, and many more to get to the heart of Afrofuturist feminist possibilities.

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Afrofuturist feminism is currently thriving in a dystopian America that is rife with apocalyptic fervor. In 2015, gunman Dylann Roof entered a Wednesday night Bible study meeting at a predominantly black church and killed nine parishioners— Rev. Clementa Pinckney, Rev. Depayne Middleton-Doctor, Daniel Simmons, Rev. Sharonda Coleman-Singleton, Twywanza Sanders, Ethel Lance, Myra Thompson, Cynthia Hurd, and Susie Jackson. Roof's desire was to start a race war; he believed that black people were "raping [white] women and taking over the country." One might be quick to dismiss Roof's ravings as those of a madman. But his act of extreme violence makes sense in the larger context of white supremacy where Blacks experience state sanctioned violence that aims to police and control. We need to look no further than the recent state sanctioned murders of Rayshard Brooks, George Floyd, and Breonna Taylor for evidence that Roof's violence is not a singular event. The current civil rights movement known as the Movement for Black Lives, whose rallying cry is "Black Lives Matter" reflects the frustration many Black communities have in the face of what is often state-sanctioned violence. Take, for instance the rise of the so-called "alt-right" movement or even the most recent presidential campaign, where rhetoric has moved from the dog-whistle politics of the "Southern Strategy" to overt racism, misogyny, ableism, transphobia, queer antagonism, and xenophobia. Too often public discourse around social problems often resort to using the looming specter of Black and Brown bodies here and abroad, "taking over" as it were, as evidence of the rapid decay of society–despite the fact that this civilization, as we know it, largely exists because of the unpaid and underpaid labor of Black and brown folk.

To be clear, much of this fear-soaked doomdayism and apocalyptic fervor has very little to do with actual violence committed by Black and Brown people, and more to do with the terror of being unable to adequately contain, police, and repress people of color. Instead, the current American anxiety about the future is absolutely connected to fear of black and brown bodies and what the potential of our increased agency and autonomy might mean for the enduring power of white supremacy. Because Afrofuturism and Afrofuturist feminism are not simply historical phenomena but a contemporary cultural aesthetic and sets of beliefs and practices, these current events are important to note. In this contemporary moment Afrofuturist feminism is best understood alongside the quotidian anti-Blackness of daily life, as it responds to the fear of blackness and misogynoir *with the promise of more unapologetic Blackness*. Thus, the visions of the future that Black women creates create are of vital importance. These works create and cultivate generative space that challenges the fear driven script of a Black planet.

Endnotes

1. In the context of this essay, transgressive means "That violates or challenges social, moral, or artistic conventions" (Oxford English Dictionary).
2. Katie Zavadski, "Everything Known About Charleston Church Shooting Suspect Dylann Roof," http://www.thedailybeast.com/articles/2015/06/18/everything-known-about-charleston-church-shooting-suspect-dylann-roof.html
3. This term, coined by Moya Bailey, refers to the hatred of black women.

Melissa Foulger

The Performing Arts in a Technological World

"I regard the theatre as the greatest of all art forms, the most immediate way in which a human being can share with another the sense of what it is to be a human being."

— Thornton Wilder

DramaTech Theatre was founded upon the mission of "encouraging the creative talents of Georgia Tech's future engineers, managers, architects, scientists, and leaders: talents that might otherwise never fully develop in the world of calculators and computers." Through multiple productions ranging from improvisation to Broadway musicals, world premieres to variety shows, DramaTech has spent over 60 years asking students to push the bounds of creativity to create quality performances for the rest of campus. More importantly, it has been asking students to find their humanity and their creativity.

Employers today want more than students who have excelled in their majors. They are looking for people who have other assets such as flexibility, problem solving abilities and interpersonal skills. The arts are an integral part of preparing students for the 21st-century workforce. In *The Arts and the Creation of the Mind* (2002, p. 70—92), Dr. Elliot W. Eisner identified key competencies of cognitive growth that are developed through arts education and enhance skill development in preparation for a career including

- perception of relationships;
- skills in finding multiple solutions to problems;
- attention to nuance;
- adaptability;
- decision-making skills; and
- visualization of goals and outcomes.

The theatre provides an incubator for development of these skills. It requires a group of people to come together as a team to create a performance. They must work together. They must problem solve. They must pay attention to detail; otherwise the show will not go on. And the show must go on—even at Georgia Tech.

When I tell people what I do, the question most often asked of me is "there's theatre at Georgia Tech?" My answer is always a resounding "yes". As the Artistic Director of DramaTech and an instructor of classes that focus on theatrical performance and production, it is my mission to illuminate the necessity for arts in the world of science and technology. The function of my job is to do just what Thornton Wilder says, to afford students the opportunity to "share with [one] another the sense of what it is to be a human being."

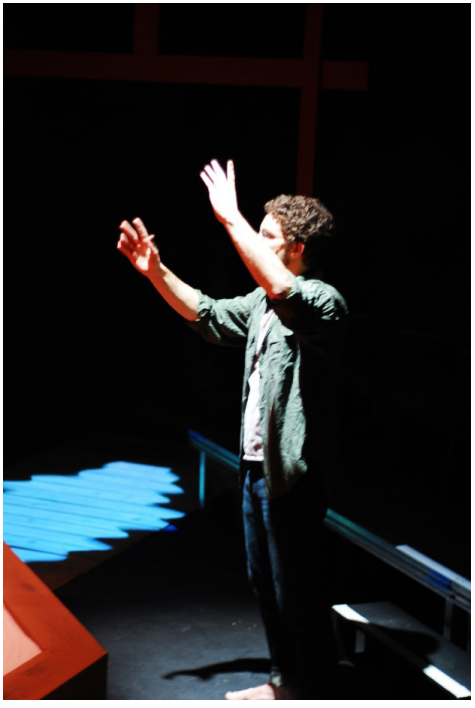
So, DramaTech thrives at Tech because it too is a laboratory. In this setting, students are given access to a theatrical space to experiment and create. They learn through a model of peer mentorship and advisement. Don't know how to hang and focus a light? Another can teach you. Never used a sewing machine? An alumnus can teach you. Want to learn how to make walls of stone from Styrofoam? Just ask and we'll bring in a local theatre professional to teach a workshop. Students are starving to learn more about the arts. They take their job seriously and are deeply committed, often matching their academic hours with hours at the theatre.

Even more exciting is the opportunity that these students receive to learn the skills that Eisner says are necessary for the current market. In production, we work in teams. This requires us to communicate about their designs and to problem solve how all of the components can cohesively come together. Students navigate the rocky landscape of leadership in a peer setting—exploring when it is appropriate to be a leader or a friend. The importance of deadlines and planning becomes tantamount as they navigate

the time constraints of the busy Georgia Tech academic life. Finally, we take risks—trying to enhance the theatrical experience with current innovation.

Recently, DramaTech worked on an adaptation of Haruki Murakami's *after the quake* in which a Microsoft Kinect was used to track the gestures of an actor. The goal of the Kinect's output was to aid in the amplification of the emotions during specific storytelling scenes. This piece of technology was developed from a Special Topics class that I co-taught with a Digital Media PhD candidate that focused on technology in performance. Students were introduced to the play and then worked in teams to develop different technologies they thought would work with the production. Through a series of pitch processes, several different technologies were devised and the Kinect was chosen as the final product to be created for the production. Students worked on coding the Kinect and building the hardware in order to give a demonstration by the end of the semester (which they were able to do successfully). We were then able to continue to implement the Kinect gesture tracking system into the final production with great success.

Regularly, students remark on how their work on productions aids the group work that they have to do for class. They find that they are better planners and communicators because they are constantly executing those skills when they work on DramaTech productions. Alumni stay connected to DramaTech because they have a close circle of friends that remain an important part of their lives. They view their time at Tech through the lens of DramaTech. It is the place where they flourish outside of the world of academics. It is their home away from home. So, when people ask me incredulously about theatre at Georgia Tech, my answer continues to be a resounding yes because, at DramaTech, we're building more than engineers, we're creating well-rounded humans.



“Poetry makes nothing happen,” as one poet said while mourning another—and while this line is often (incorrectly) read as defeatist, Auden goes on to say that poetry is ‘a way of happening.’ It won’t fix a broken iPad or invent a new polymer, but it might help you live a better, richer life.”

Aaron Santesso

Value and Literary Study

"It is difficult to get the news from poems," said William Carlos Williams, "yet men die miserably every day for lack of what is found there." Literature isn't the most utilitarian field, but it's a vital one for those interested in educating themselves. Its presence in the curriculum is one of the things that makes a university a university instead of a trade school.

What is the value of studying and teaching literature? For some, it is that it "makes you a better person"—or, to put it in slightly more measured terms, that it increases your capacity for empathy. This was the argument of Matthew Arnold, for one, and it was the conclusion of a recent, widely-cited study published by two social psychologists. For others, the value of literary study is found instead in a slightly more practical ability called "critical thinking," which we improve when we learn how to read well.

I confess that for myself, the "value" of studying and teaching literature is something much more ephemeral: I've known enough literature-addicts who were also horrible people to be skeptical of the first claim, and I've been in academia long enough to know that everyone, in every field, thinks that they're teaching "critical thinking" (even if no-one really knows what it is). But I do think that literature represents an extremely important and powerful body of knowledge and cultural practice, and that it influences a wide range of activities and institutions. And more than that: it gives some insight into the human condition itself. "Poetry makes nothing happen," as one poet said while mourning another—and while this line is often (incorrectly) read as defeatist, Auden goes on to say that poetry is "a way of happening." It won't fix a broken iPad or invent a new polymer, but it might help you live a better, richer life.

How so? For starters, studying literature can provide perspective. Literature allows us to view issues through various prisms—historical, psychological, etc.—that we would otherwise not have access to. The personal intellectual, philosophical and even spiritual ramifications of this should be clear enough. Less evident, perhaps, is that this broadening effect can have practical social implications. Our own motto here at LMC suggests that we provide "humanistic perspectives on a technological world." This doesn't just mean slavishly celebrating technology: it means enriching it, or pointing out its shortcomings, or identifying areas where "humanistic" approaches make more sense than "technological" ones.

One of these areas, I suggest, is surveillance. My most recent book, *The Watchman in Pieces*, co-authored with Professor David Rosen (Trinity College), is about the connections between literature and surveillance, and how the two have "grown up" together and influenced each other over the past 500 years or so. Although most of the book approaches surveillance from a philosophical angle, I also spent a good amount of time interviewing people who worked in surveillance fields (FBI profilers, Scotland Yard detectives, casino security, etc.). One thing we learned, and which we tried to convey in the book, is that people have been alternately enthusiastic and worried about new surveillance technologies for centuries, even as people who actually work in the surveillance industry continue to rely on what we might call "humanistic" skills: analytical ability, interpretation, putting things into perspective, etc.

While some people imagine literary studies as a retreat from real-world issues, then, my own experience has been the opposite, and I am dedicated to showing the relevance of literature to pressing social, political, technological and legal issues. Ideas have to come from somewhere; often, they come from literature (as Shakespeare put it, poets "give to airy nothing a local habitation and a name"). An example: privacy was first formally identified as a right which needs legal protection by Samuel Warren and Louis Brandeis in their famous 1890 essay "The Right to Privacy." Professor Rosen and I wrote an article showing how much of the language Warren and Brandeis used to define the value of privacy was taken from poetry (specifically, from Wordsworth). Our own article has now been cited in several law review articles—as well as *The New Yorker*. I cooperate with numerous non-academic institutions and outlets: I've worked with the ACLU and PEN/America on surveillance issues; Professor Rosen and I recently wrote a piece on Tolkien and NSA surveillance for *Slate*.

My research interests are fairly diverse: I've published on everything from zoos—an obsession of mine—to the connections between science fiction and fascism. My original training is in the literature of the "long" eighteenth century (*Robinson Crusoe*, *Gulliver's Travels*, *Pride and Prejudice*, etc.), and I teach Enlightenment literature regularly; I also teach courses on classical literature, spy novels, utopian literature, media studies, fantasy literature, and other topics. This comes in handy at a school like Tech, where humanities professors tend to teach across a broad range of subjects. I do teach a class on surveillance and literature, where we practice honing interpretive and analytical skills—the skills intelligence analysts cherish, incidentally. As those social psychologists studying the value of literature put it, good readers just might be better at "Reading the Mind in the Eyes" when they look at people. Of course, very few of my students go on to futures in the intelligence world (as far as I know…), but they do work in fields ranging from law to politics to finance, and I try to provide some lessons that they can draw upon as their careers progress.

Whether I'm researching or teaching, I try to engage with the latest technology, with current trends, with the issues of the day, etc. But I also try to balance all this with something permanent and timeless. Poetry may make nothing happen, but Auden also pointed out that poetry has one great virtue: in an ever-changing, trend-chasing world, it remains stable; it flows through society and connects people; "it survives."

Jay P. Telotte

Film, Media, and SF at GT

Film and Georgia Tech seem a natural pairing. Film is, after all, a technologically-based art form, in both its creation and its audience reception/appreciation. And its evolution into perhaps the dominant contemporary art form—a claim slightly challenged by its near kin, television—is manifest by a series of technological developments that have left their mark in many other areas of our lives—concerns with image reproduction, sound capture and amplification, color processes, screen development, computer-generated imaging—enabling various other entertainment and educational technologies that are today a pervasive part of human experience. The history of film and other visual media simply opens onto many dimensions of our technological experience, as well as of a modern technological education.

The study of film involves more than just understanding the history, theory, and criticism of a highly significant art form. It also requires that we develop some understanding of certain scientific principles and technological processes that can help us to understand the extent to which, even when thoroughly engrossed in the work of art, our enjoyment and even education are technologically-enabled. Of course, donning 3-D glasses at the local multiplex to watch a computer-animated film makes that context at least momentarily obvious to us, but multiple variations on that technological context condition every movie experience, and we need to become more mindful of how other aspects of our lives and cultural experience are also technologically enabled, as we always, in various ways, see through the lenses and on the screens that society provides. Focusing on films—and television—about technology, particularly on science fiction in its various media forms, can facilitate such an awareness.

LMC has offered multiple media courses focused on the world of science and technology, among them, "Film and the Machine Age," "The Science Fiction Film," "Science Fiction Television," "Across the Screens: Adapting Science Fiction," and "Global Science Fiction." These courses allow students to explore a variety of technological depictions and track how cultural attitudes have changed towards the machine, space exploration, urban design, the robot/android/cyborg, the scientist (mad and otherwise), and even research itself. Through them we can observe how in various ways our culture has sought to address issues of both technophobia and technophilia, even to suggest ways of balancing such attitudes.

These courses also reflect the larger popularity of the genre, and allow us to explore why SF has such a prominent place in today's media landscape. I want to suggest three very simple reasons that might help explain

that popularity, and in turn, reasons why we should be paying closer attention to, even, as part of our interest in film and television, studying SF's history and characteristics. The first, and perhaps somewhat superficial answer, is because we can do it; funding and technology have both changed, allowing for the genre's proliferation. A second is that we have to do it; science and technology, it seems, keep getting in the way of our lives, popping up in full view and practically forcing us to take notice. And a third is that we simply should do it; it makes sense and helps us make sense—of ourselves, our world, and our futures.

We can do more and better SF for many reasons, not the least of which is the sheer availability of both equipment and outlets. Films (and more broadly video) have become relatively easy to make thanks to the impact of computing power and low-cost, high-quality digital cameras—even cameras available on smartphones and tablets. Various independent film festivals offer a ready audience/outlet for material, as do established venues like the Syfy Channel and a proliferation of cable/satellite channels. And with that increasing number of venues and broadcast slots there comes more potential money available for developing SF films and programs. If you have an idea for a show that might have an audience, and if you know the right people, you can get a hearing; if you're convincing and have skill, you could get seed money or turn to Crowdsourcing; and if that pilot is any good, there is a strong chance for an airing before a national audience, for at least a try-out. But even smaller ambitions—and smaller resources—also stand a chance of reaching fruition and finding an audience in an age of i-phones, laptap-loaded editing tools, and YouTube. "Broadcast yourself," in fact, is

But in today's world, big-time science is constantly developing big-time and sometimes quite dangerous technology that we cannot help but run into and be surprised by.

the come-on for YouTube, suggesting not only the ability to make films, but the alluring possibility of almost instantly showcasing the self, speaking directly to an audience of millions.

I also suggest that we almost have to do more SF and learn more about it. That perhaps strange assertion comes from the recognition that we live in a highly technologized society, in a world where we cannot get away from technology, as well as the science that creates it and the reason that conceives it. In fact, that triadic relationship—of reason, science, and technology—is one that we live with, that informs all that we do today, and that finds its way into so many of our films and programs. So we have to recognize how the elements of science and technology invariably show up more and more, working their way into our narratives just as they are worked, almost imperceptibly, into our lives. And of course we need only note how often science is becoming woven even into many popular films and programs that make no pretense to being SF, including television shows like *Modern Marvels*, *How Do They Do It*, and *Rocket City Rednecks*. But in today's world, big-time science is constantly developing big-time and sometimes quite dangerous technology that we cannot help but run into and be surprised by. What our media renditions of those run-ins help to do is prepare us for such encounters, make them somewhat less surprising or discomfiting, clearly a part of our world.

So I would suggest that this inevitable encounter is a good thing and gives reason to my even stranger-sounding third suggestion that we should be viewing and studying more SF. That "should" has almost a moralizing ring to it, as if implying that SF were somehow good for us. But it may well be. If we accept some of the previous premise, that we are going to keep tripping over science and technology anyway, then it follows that trying to understand it for our individual mental health and for our larger cultural health is important. Genre stories serve as important cultural highlights and problem solving devices. Through their central concerns those stories echo our cultural anxieties, and through their conventions help us make sense of those things. The more popular media genres in any period have that status, that level of popularity, I would argue, largely because their trappings are best suited for helping us make sense of, better understand, or simply find some way of being reconciled to the culture of the period. And in this technologically and scientifically-driven era, SF film and television, especially as we deal with it at GT, helps in this task.

“LMC delivers in-class instruction not only on the skills needed to present in front of a class, but how best to interact with a diversity of cultures and venues (i.e. news media, social media, fans, and other stakeholders).”

Phyllis LaBaw,
Associate Director of Athletics,
GT Student-Athlete Support Services

Melissa Ianetta

A Writing Program as a Disciplinary Experiment, A Humanities Building as a Disciplinary Lab

If you have been in the Stephen C. Hall building, you know that it is a striking juxtaposition of historical preservation and modern design. While the location attends clearly to students' needs as learners and writers in this modern age, this focus has been combined with an attention to preserving the building's historic past: rough exposed brick is contrasted by smooth steel railings; doors of glass stand side by side with aged wood lintels. As an environment, it's an energizing combination, one which is very much a sum of its disparate parts. The energy of the space comes from its yoking of the narrative of one kind of place—the traditional —to that of another—the modern.

Hall Building, Preserved historic wall

My new position as the Director of the Writing and Communication Program (WCP) has deepened my appreciation of this building, not only as my new academic home but also as a visual representation of my research. That is, throughout my career, I've concerned myself with disciplinarity and its impact, focusing on ways in which the boundaries, histories and traditions that help to define a community of inquiry can also shape and, sometimes, limit its sphere of activity and impact its relationships with other fields of study. Broadly speaking, much of my scholarship

has taken place at the intersections of writing, literary and rhetorical studies, a conglomeration among which there has been much debate over how these fields evolved, what knowledge counts as important, what students need to know from the canons of each—and who is most qualified to decide such questions. In these overlapping areas, I have focus primarily on a writing studies audience using methods of disciplinary history, pedagogy, and the scholarship of administration. My range of work further suggests some of the ways in which those fields concerned with eloquence might do more than merely uncomfortably brush up against one another in the pursuit of knowledge. Rather, I highlight how we might embrace such moments of collision as instances when disciplinary perspectives can productively come together. Put another way: my scholarship argues for an expansive view of the rhetorical and poetical disciplines and, like the building in which I now work, argues that the very best futures will yoke together separate traditions of inquiry.

In many ways, this attunement to the meeting of disciplines brought me to the School of Literature, Media, and Communication and the WCP. For I am not only interested in learning from and about the School as a program that blends a range of subjects in ways that open up new futures for humanities faculty, but, most immediately, I am deeply excited to blend my interest in the stakes of disciplinarity with the work and mission of the WCP. Its Marion L. Brittain Fellowship program is an exemplary site at which to investigate the possibilities and best practices of the postdoctoral experience for humanities PhDs, such as the individuals who comprise the majority of the WCP faculty. As opposed to career trajectories in the sciences, where postdoctoral programs are a long-acknowledged part of a career path, in literary and writing studies such postgraduate experiences are extremely unusual. Particularly rare is a "true" postdoctoral experience, one which the National Postdoctoral Association describes as "a temporary period of mentored research and/or scholarly training for the purpose of acquiring the professional skills needed to pursue a career path of [one's] choosing." Not merely the opportunity to continue the work of the dissertation or to commit to a high teaching load while looking for other employment, then, a complete postdoc experience carries with it a requirement to develop new skills and dispositions that expand one's intellectual and professional horizons. Such preparation beyond the doctoral degree is urgently needed for those newly minted humanities PhDs whose training has long been designed as a path to the professoriate, given the difficult fact that such job opportunities are now at an all-time low.

The distinction of the WCP program as developed under my predecessor, Dr. Rebecca Burnett, in one sense can be seen as an attempt to address the problems of the humanities by borrowing professional development strategies of the sciences. For in its attention to this development of that broad set of skills and expertise that will expand and enhance career choices (such as digital humanities pedagogy, leadership experience, and assessment expertise) the Brittain Fellowship works to offer a true postdoc experience. My current research, then, looks at the postdoc effect on both the career trajectories of our former Fellows and its influence on their sense of the professional possibilities afforded by their own scholarly expertise. In this manner, I am concerned with the evolving identity

of Brittain alums and so view the WCP itself as a sort of experiment in disciplinarity, a calculated intervention in the postgraduate trajectories and identities of humanities scholars. Ultimately, I believe that tracking the former Brittains' evolution subsequent to the postdoc experience will help both new humanities PhDs, as well as the individuals who support and mentor them, to better understand the ways in which that academic preparation long thought to be an apprenticeship for the traditional professoriate can, in fact, intersect and enrich other areas of knowledge in and beyond the university. It seems apt, then, that the Hall building, with its blend of the old and new, serves as the home for this inquiry and for those evolutions of the Brittain Fellow program that will be based in this work. Ultimately, then, while this research continues my career-long focus on the stakes of disciplinarity, it positions the WCP, with its 30+ fellows, as an experimental site, looking to the Fellows themselves as future leaders who help to chart possibilities not only for their Brittain colleagues but for their counterparts at other universities. In this sense of joining the past and the future to the benefit of the greater community, then, the Hall building really symbolizes not merely my individual research but, rather the collective work of the Writing and Communication Program.

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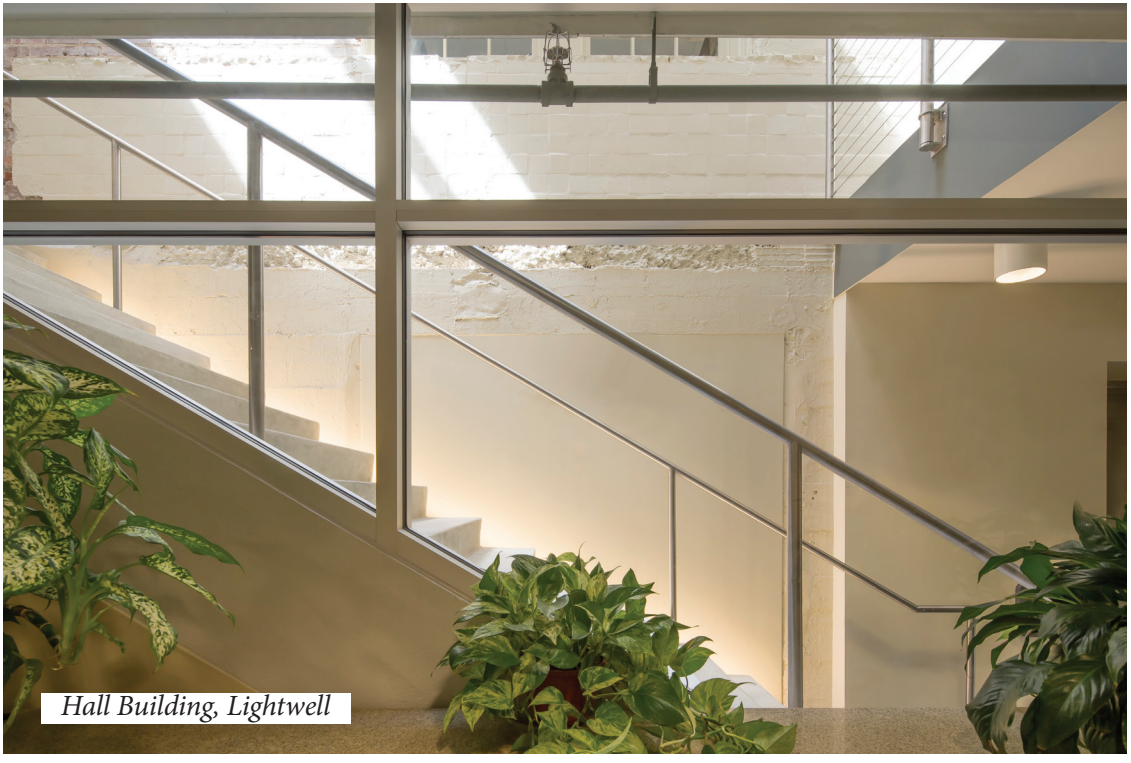

Hall Building, Lightwell

LMC's Chris Le Dantec (right) and collaborator Kari Watkins (left) with Atlanta Mayor Kasim Reed. Le Dantec and Watkins created Cycle Atlanta, an iPhone application that tracks cycling routes and is designed to help the city with future cycling decisions.

Christopher Le Dantec

Designing Community Engagement

Civic engagement is changing: new venues of public participation are arising out of the development and mass-availability of new mobile technologies and social media; new practices of governance and democratic discourse are arising out of the collection and representation of data; new interaction design practices are emerging from working directly in public and community settings. Running through these changes to civic engagement is a new-found fascination with data and with the distributed tools for collecting, representing, and analyzing that data. Systems like PublicStuff and SeeClickFix turn to citizens to contribute data about city infrastructure to help local governments provide services. Apps like StreetBump in Boston, or Cycle Atlanta similarly turn mobile phones into sensors to respectively detect potholes and the routes of cyclists through the city. This fixation on data raises a host of important issues of equity and social justice, where we need to build tools and practices that don't just employ data to support and govern our communities, but where those tools are socially and culturally situated and informed by the values and goals of the communities that are creating—and being created by—myriad forms of data.

My background is decidedly technical: originally trained as an engineer and spending the better part of a decade as an interaction designer, I quickly grew to realize that of the many things that are possible with technology, the only possibilities that truly count are those that resonate with human values. It was at this point that I re-entered academia, first as a Ph.D. student at Georgia Tech (Human-Centered Computing), and now as faculty. My shift from industry to academia was driven by a commitment to creating technologies informed by a careful consideration of human values: the principles, the ethics, and the identities which inform our relations in the world. My position is deeply informed by the humanities through both theoretical perspectives and design practice, and it is uniquely tied to a robust understanding of computing.

In particular, I am concerned with issues of equity and social justice as they are enacted and foreclosed upon in new forms of digital democracy. By way of example, much of my early research was focused on examining the impact of the Internet and mobile phones on the urban homeless: how do the urban homeless use these technologies? How do social service providers use these technologies? How are these uses shaping what it means to be seeking and providing care for some of the most vulnerable members of society? On the one hand, the Internet and data-driven management has helped care providers track their services and estab-

lish outcomes-based programs; on the other, these instrumental uses of technology enforce strict categories of care and dehumanize the homeless by treating them as a symptom to be remedied rather than involving them in the co-construction of aid and programs to return stability to their lives. By turning the homeless into data and then relying on that data to inform services, funding, and policy, we miss the opportunity to use the same technologies to support the interpersonal and collaborative relationships between care provider and care receiver.

Another example comes from more recent research I have been doing with the City of Atlanta. In collaboration with faculty in Civil Engineering, I and my students launched a smart phone app so that cyclists in Atlanta could record their rides and share that data with city planners. The City, for its part, is intent on substantially increasing the bike lanes and facilities to make the Atlanta urban core a more bike-friendly place. One of their stated goals when beginning the project to expand cycling infrastructure was to broaden public input and participation in the process of developing those plans. Smartphone apps that enable real-time data collection offered clear benefits for meeting such a goal: it enabled the City to collect data it never would have had otherwise, it enrolled a large public of cyclists in the collection of that data, and it created a new kind of public participation in Atlanta, one that was pro-active in shaping planning decisions. Yet, even with these clearly established goals, a number of difficult challenges arise: the recorded routes make some parts of the city very visible to planners, while other parts—particularly neighborhoods with low socio-economic status—remain under-represented; different kinds of participation with the smartphone app greatly impacts the data collected—riders who record their ride every day versus riders who only record rides once in a while or if they travel a new path; a new form of civic labor is created and deployed and the relationship of participating through the app and through the data collected versus more traditional forms of public participation remains to be examined.

I am concerned with issues of equity and social justice as they are enacted and foreclosed upon in new forms of digital democracy.

The imperative here is that in both of the areas of work I'm involved with, the technology enables multiple opportunities to improve people's lives. The open question is which people's lives are improved, and as technology is developed for civic and community goals (rather than industrial and commercial goals) turning the to the humanities is crucial in order to inform first how we conceptualize public participation, how we position the role of design in creating capacities to act and not just products, and how we approach new forms of distributed labor—a la crowdsourcing and social media—to develop collective and collaborative responses to social issues.

Humanism, Technology, and Performance Studies

Philip Auslander

Performance is deeply embedded in human life, whether we look at the performing arts, everyday social interactions, religious ritual, or any of the other myriad forms it takes on. Performance is so intrinsic to human existence it has been suggested that it may be a defining characteristic that distinguishes us from other species, that human beings might be described as homo performans. We certainly can—and do—ask whether non-human animals or machines can perform. Even if we answer such questions in the affirmative, as I am inclined to, we realize that when animals or machines perform, they do so at the behest of human beings—there is always a trainer or a programmer somewhere in the mix—and for a human audience. Horse shows do not attract audiences of horses anymore than robots have thus far expressed an interest in seeing other robots play Hamlet. When we ask whether or not non-human entities can perform what we are really asking is whether animals or machines have the capacity to perform in the same ways and for the same reasons we do. The idea of performance is a human invention, and we are the ones who care enough about it to wonder just what it is, who can be said to do it, and under what circumstances, questions that are at the heart of Performance Studies.

Because performance is so deeply imbricated with human existence and consciousness, it is impossible to extricate the study of performance from humanistic inquiry. Looking at our technological world through the lens of Performance Studies is thus a deeply humanistic endeavor, whether we study the performance of identity via social media, the nature of performance in Massively Multiplayer Online Games, the potential of robots as performers, or any of the other phenomena our technologized environment offers up to the curious. For me, looking at technology from a perspective informed by Performance Studies initiated a hermeneutic circle, for I found myself interrogating the concept of performance I started with by testing its application to technological artifacts and phenomena. For example, considering whether robots could be considered performers led me to think about the function of repetition in performance generally. Repetition is fundamental to performance: a performer who can do something only once is of little value. In my work as a film actor, I am called upon to repeat the same actions and lines many times in succession, usually identically. As humanists, we may prefer to emphasize the art in performance, its interpretive and expressive dimensions. But the fact remains that a great deal of what we ask performers to do involves repetition that borders on the mechanical. Since robots are much better at repeating themselves exactly than we are, they arguably are the better performers, at least in this limited sense.

Repetition is fundamental to performance: a performer who can do something only once is of little value.

Performance Studies as a field traditionally has taken live performances and other kinds of face-to-face encounters as its default models for what performance is and has shown itself institutionally to be somewhat resistant to thinking about kinds of performance that do not take such forms. Even if we restrict our discussion to the performing arts, however, we quickly realize that audiences consume performances primarily in forms other than face-to-face events: we watch videos or listen to mp3s far more than we go to the theater or even concerts. What I have chosen to call our mediatized culture, in which cultural expression and consumption take place largely through media technologies, is the primary context in which performance takes place today, a context that influences not only the way performance is accessed and perceived by audiences but also the very nature of performing itself. There is a long and ongoing history of kinds of performing that would not have been possible save for the development of specific technologies. Without the microphone, the style of singing known as crooning that emerged in the 1920s and '30s and became a staple of early radio would not have been possible. CGI (Computer Generated Imagery) has made it possible for actors to embody entities physically very different from themselves with great illusionistic detail. It has also seen the emergence of a new type of performer, the motion-capture specialist who understands how to perform for this technology the way earlier actors had to learn to perform for the microphone, the camera, television, and so on. I am interested in the ways performance engages with and is caught up in our mediatized cultural environment. I look at performers' uses of technology and how media technologies provide contexts within which performances happen.

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Robert E. Wood

One Cultural Context

Traditionally, literature, art and science have been studied along independent timelines with minimal cross-referencing. What Western historians now call the Early Modern period is studied as the Renaissance, the Age of Discovery, the Age of Print, and the Scientific Revolution. Yet the events and achievements explored in these categories are highly interconnected. I examine here merely one path through this matrix of interconnectedness.

Even before the print explosion, changes in visual representation, particularly in painting began to affect the way the world was seen. The creation of the illusion of depth within a plane surface through perspective, strongly associated with architecture in the early stages of its development, also prompted changes in visual narrative, allowing a correlation of depth with time. Almost equally important was the representation of light as having a source and direction. Light and shadow contributed to what we would call realistic representation, but also affected the way the world was perceived. The world was subject to a more intense scrutiny both in science and in art.

Leonardo da Vinci is a name virtually synonymous with Renaissance Man. But though his versatile genius found connections everywhere, it is also true that fields of endeavor were less narrowly defined in the period. He serves as an example of the kinds of thinking that were possible in the period rather than as the initiator of a school of thought. Aside from his famous paintings, Leonardo is best known for his studies of flight. But to my mind, his most remarkable characteristic is his tendency to connect everything with everything else. His study of painting is connected with how we see, with the geometry of representation, with what lies beneath the surface. but his curiosity extends beyond the needs of painting to the heart and the foetus. Some aspects of anatomy address his engineering concerns, the comparison of human anatomy to that of a bird for example. Some of his ideas anticipate a heliocentric system and he knew that lenses could be combined to magnify the moon. Comparatively few of Leonardo's ideas were acted upon and few individuals approached his range of interests, but the kinds of connections he was making grew from a way of looking at the world strongly connected with changes in visual representation.

Galileo's scientific work and its dissemination fully reflect the literacies of the era and the increased pace of the communication of ideas. Galileo's famous astronomical discoveries were precipitated by the news that someone was using lenses in Northern Europe to look at the heavens. Lens grinding had been available in

Italy at least since the thirteenth century and the theory for constructing a telescope perhaps since Euclid. Galileo's discoveries of the topography of the moon, a host of previously unknown stars, and four of the moons of Jupiter made such a striking impact on Europe because he was able to promulgate his findings through a printed book, *Siderius Nuncius* (*The Starry Messenger*). Part of the accessibility of his book results from his rhetorical skill, but a further factor is his skill as a draughtsman and the visual literacy of his audience. For he explains the general topography of mountains and craters through the way light strikes a landscape at sunrise. Granted the analogy would have been applicable in any era, but that it seemed the most natural way to explain his observations seems characteristic of a particular way of looking. Later in his career in his *Letters on Sunspots*, Galileo speaks of the perspective representation of a sphere to explain his argument that the horizontal foreshortening of the sunspots as they reached the visible edge of the sun argued that they were on or near the surface of the sun. But the more powerful the book became as an instrument of communication, the more dangerous it became.

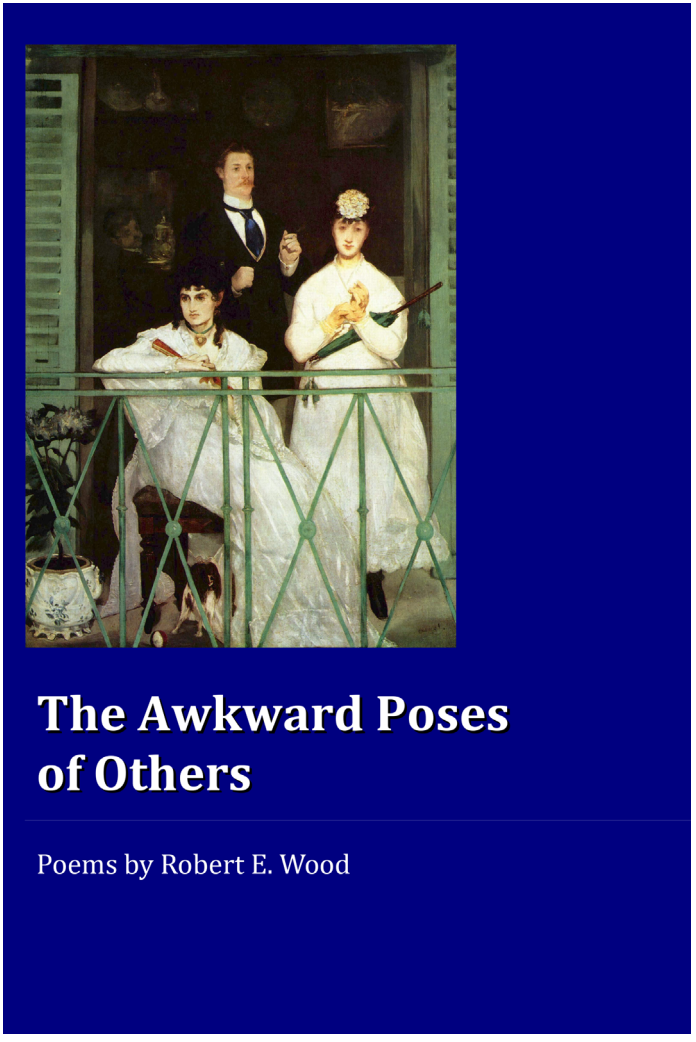
Publishing also made possible an appeal to a wider public and an argument for a new methodology and a new world view.

Print was the great accelerator. In astronomy, the work of Copernicus was published after his death leaving him clear of controversy, but with an accessible legacy in print. A minority view could be successfully circulated in print. Later astronomers Kepler and Galileo had access to each other's published work. Because their research projects were independent, they were able to proceed to results using different assumptions. Kepler was inclined to privilege Platonic solids; Galileo insisted that no form in nature had other than a utilitarian value. Publishing also made possible an appeal to a wider public and an argument for a new methodology and a new world view. Print enabled political pamphlets, the distribution of vernacular translations of the *Bible*, and the print battles of Reformation and Counter-Reformation.

One can hardly distinguish the religious struggles of the period from the political struggles and the power of the book provoked the exercise of power over the book. The vernacular languages of the various regions of Europe were becoming suitable for cultural and scientific work. The translation of the *Bible*, Christianity's most important book, into various vernaculars was one of the primary endeavors of the Protestant Reformation. For Roman Catholicism, the imprimatur (literally, let it be printed) was an attempt to control the promulgation of subversive ideas. In this context, the struggle between Galileo and the Inquisition, often seen as a battle between Science and Religion takes on further dimensions. The topic of Galileo's book, *The Dialogue of the Two World Systems*, challenged no doc-

trine. It is perhaps Galileo's least scientific book, containing a number of traditional arguments, no new evidence, and even a misconception about the tides. But books have an unusual property. What is suppressed is deemed important and becomes more powerful than before. One might view the conflict more as a struggle against a technology than against a scientific theory.

As I have suggested, this is a single thread of associations that begins to explore the rich interactions that constitute the fabric of human endeavor. We can never fully understand any aspect of human culture—the scientific, the technological, or the artistic—in isolation.



Robert E. Wood's book of poetry, The Awkward Poses of Others, which earned him the Author of the Year in Poetry Award by the Georgia Writers Association

“Georgia Tech’s mission is to develop leaders who advance technology and improve the human condition. To deliver on that mission we need to educate talented scientists and engineers, designers, innovators, and business leaders. And, very importantly, we need humanists who can deepen our understanding and shape our thinking about the most consequential issues that we face—the aspects of the human condition that need improving.

The School of Literature, Media, and Communication (LMC) plays a vital role at Georgia Tech, both in educating majors in six threads of enormous contemporary significance (Literature; Media; Communication; Social Justice; Design; and Science, Technology, and Culture), as well as in enriching the worldview of students in other disciplines. No matter the area of specialization, if our students are to grow into leaders who can make a difference they need to develop a critical view of the world around them, and they need to be able to effectively communicate an inspiring, meaningful, and impactful idea of the change they wish to see in that world.

That is the essence of our motto, progress and service.”

Ángel Cabrera, Ph.D.
President, Georgia Institute of Technology

Ute Fischer

Communication at Work

What does a psycholinguist turned team researcher do in LMC? The short answer is "My research focuses on communication at work ." I study how practitioners communicate with each other as part of their collaborative work and seek to understand what makes their communication effective and why it may fail. Ultimately I am interested in finding ways to support team communication and as a result, ensure a team's successful task performance.

Teamwork has become the modus operandi in the workplace of today. Organizations increasingly rely on teams when tasks are complex and ill-defined, when time is limited and errors have potentially severe consequences. Not surprisingly, teamwork is the strategy of choice in many safety-critical domains. In hospitals patients are cared for by a team of physicians and nurses. In aviation a multitude of professionals work together to keep air travel safe, and ever since Apollo 13 we appreciate the importance of teamwork in spaceflight operations. To name but a few examples.

Clearly, communication between team members is essential for safe and efficient work. Less clear is what constitutes effective and efficient communication. The focus on the task may lead one to assume that team members ought to be as explicit and direct as possible. However, research on pilot communication that I conducted with colleagues at NASA, suggests otherwise. We presented commercial airline pilots with scenarios describing an error by the pilot-flying, such as an altitude deviation, and types of communications that pilots in a previous study had used to mitigate the same error. Participants were asked to imagine that they were the ones who had committed the error described in the scenario and that the communications were directed at them. How effective do they think would each communication be in that situation? Communication strategies that both captains and first officers judged to be most effective were those that addressed the problem and highlighted the crew's responsibility for coping with it. Our research showed that yes, team members ought to be explicit about what is wrong and what has to be done; but to be effective, there is no need to assign blame ("you overshot the altitude") or demand action ("get back to our assigned altitude!"). Instead, according to our study participants, team members should use what we called team-centered communication; that is, communication strategies that speak to the problem and to the fact that it is 'us'

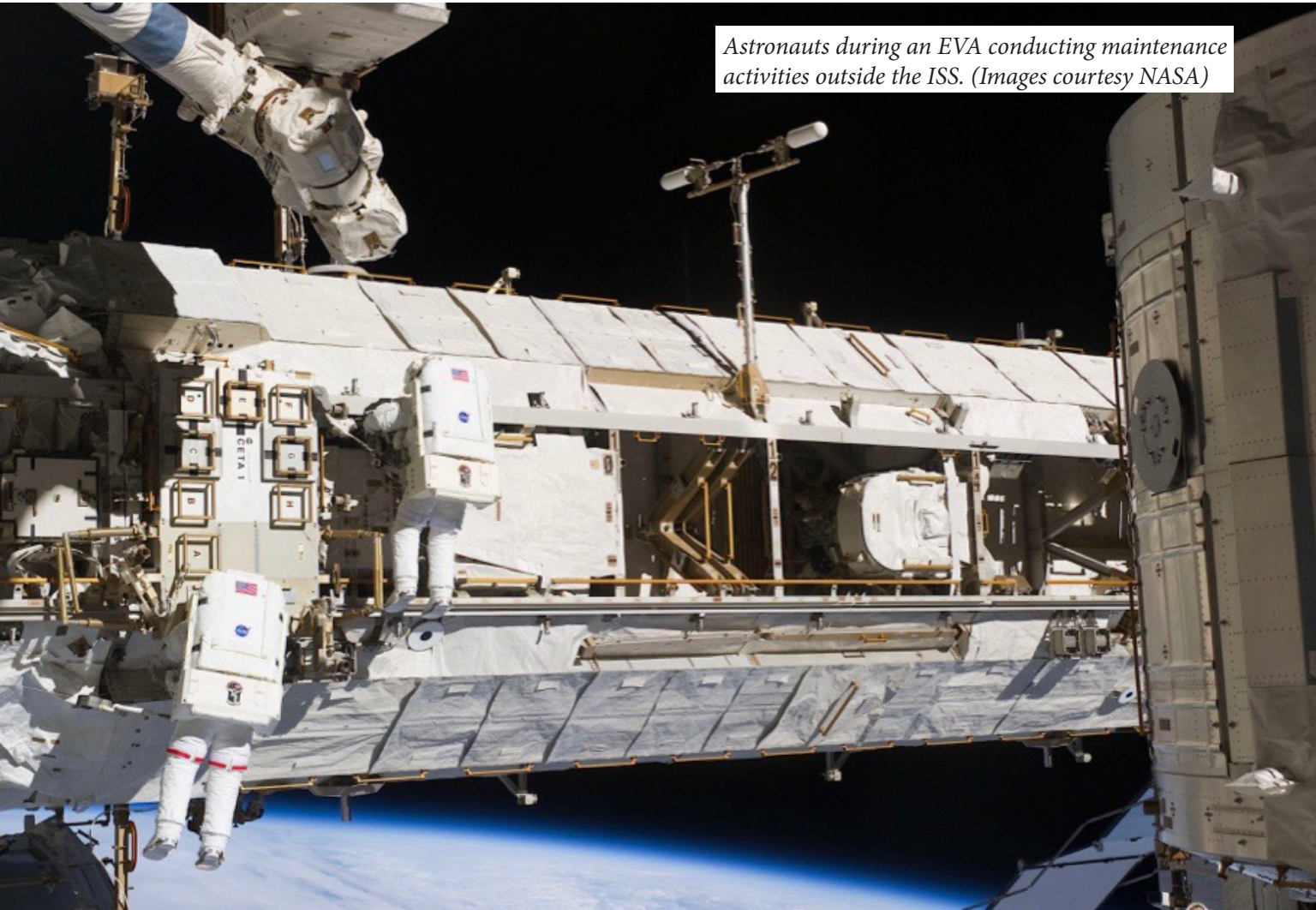
who need to work the problem – "We need to/let's get back to our assigned altitude." These research findings have led to training recommendations and ultimately to changes in pilot training at various domestic and international commercial air carriers, and have also been incorporated in a team training program for nurses and physicians.

Teams may also be comprised of members who cannot be at the same place and thus have to collaborate remotely. Human spaceflight is an extreme example of remote collaboration. It quite literally magnifies the distance between remote team members and the different worlds they inhabit. Not surprisingly, inadequate communication and cooperation between space crew and flight controllers have been observed in past space missions. Problems included psychological closing and in-group/out-group mentality by the crew, as well as differences in the task models of crew and

Overview of the flight control room in the Johnson Space Center's Mission Control Center as flight controllers support Extravehicular Activity (EVA) by astronauts on the International Space Station (ISS).

flight controllers, as when crewmembers expressed frustration about unrealistic task schedules or procedures that did not sufficiently account for their perspective. These issues are likely to be exacerbated during long-duration spaceflight and exploration missions in which increasing distance to Earth is associated with significant delays in space-ground communication. As missions travel further from Earth, delays in communication with mission control may extend up to 20 minutes one-way, a reality that poses a formidable challenge to team communication and ultimately to mission safety and success.

How best to support crew-mission control communication during delayed conditions? In a series of studies we—a research team of colleagues at San Francisco State University and at NASA and myself at Georgia Tech—took up this question. The first step was to identify the communication



Astronauts during an EVA conducting maintenance activities outside the ISS. (Images courtesy NASA)

problems that remote team members experience as a result of the delay. Not surprisingly, we found that communication delay degraded the communication process and made it more difficult for team members to establish common ground. But surprisingly, the length of the delay did not matter nor did the communication medium (voice or chat). In addition to the obvious threats inherent in having to wait for responses to potentially time-critical information, there were problems with message management and comprehension that stemmed from remote partners' failure to tailor their interactions and expectations to the communication delay. For example, team members often expected an immediate response and misinterpreted the time-lag as a communication problem, or they mistook a remote member's communication received immediately after their own transmission as a response to it. Well-performing teams developed adaptive strategies, such as announcing the specific time at which to expect a transmission, or specifying the topic of a message. However, they did not consistently adhere to these strategies, especially when workload was high. These strategies were the starting point for the design of a communication protocol—a structured template to facilitate remote collaboration under time-delayed conditions. In a final study we took the protocol to a test with encouraging findings. Astronauts and astronaut-like professionals showed high acceptance of the communicational protocol and rated it as highly effective in supporting their interactions with ground support.

It is worth noting that the communication protocol not only targets how to speak or write during delayed conditions but also points to technological solutions, ranging from rather simple improvements to a texting tool (such as to indicate not only the time a text message was sent but also the earliest time a response can be expected) to developing texting and voice messaging tools that help users structure their communications. In addition, the application of such a protocol is not limited to space exploration missions but could generally support communication between remote partners, either under delayed conditions or when time and thus precise communication is critical (as in telemedicine, for example).

As a research scientist in LMC, I provide students with the opportunity to learn about communication analysis as they work with me on various projects. If there is one lesson I hope students take away from this experience, then it is an appreciation for the complexity of human communication. Students typically start out with the assumption that communication is easy and its meaning clear; an assumption that communication analysis will inevitably shatter. Once you take a step back and ask how does communication work, what do team members 'do with words' right here in this situation, you find ambiguity and that can be a disconcerting insight. But if you persist in your questioning, you will see an intricate collaborative process at work of building shared meaning.

The International Space Station (ISS) as seen from the space shuttle Atlantis. (Images courtesy NASA)

John Thornton

Storytelling and the Art of Filmmaking

In the past, independent filmmaking was a highly regarded, secretive, risky, and expensive practice. Thus, very few people would lay claim to the title "filmmaker," and instead were limited to "patron," "audience member," or "viewer." With the advancement of emerging digital technologies the practice of filmmaking is becoming more easily accessible. In fact, filmmaking titans, like Academy Award Winners Roger Deakins and Peter Jackson, have not only shifted from using celluloid film and antiquated technology, but have also championed digital film and its streamlined workflow. The practice of film is now for the people. Anyone with a smartphone, tablet, DSLR, or video camera, and a simple editing program like iMovie can create "instant content" and distribute it on the web via Youtube, Vimeo, Blip, or Tumbler. Likewise, online services like Ustream have revolutionized the distribution model, offering "instant content" creators a "socially-fueled video platform" to build an audience and broadcast content live over the web. But, "with great power comes great responsibility." So, what distinguishes "instant content" from cinema?

Each semester, I begin my classes with several probing questions regarding cinema - What is Cinematic? And, what are the most easily identifiable aspects of motion pictures that determine if it is indeed "cinematic? Is it the lighting? The acting? The "look?" Rarely does anything in a film occur by accident, by chance, or by whim. Instead, the creative visionaries, including the director, the production designer, and the director of photography, collectively decide how the audience should feel throughout the film, and then they develop plans to trigger those emotions. Whereas "instant content creators" often accept the tools and elements that are at their disposal, filmmaking is a deliberate exercise that tests the creator's ability to map every beat, secure every location, plan every shot, interpret every musical cue, and plan every lighting change. It is an intentional process of selecting the appropriate tools for the story, to prompt emotional responses from the audience. Thus, although elements like excellent lighting and performance are common in "cinematic films," they are attributes that work together to achieve the greater goal of revealing the story. They are but instruments in the storyteller's toolbox. The filmmaker's selection of the appropriate instruments to tell the story, then, is ultimately what will determine if a film is "cinematic."

Such method of inquiry is significant, because before my students ever touch a camera, or are introduced to the lighting and grip equipment in the LMC's video lab, they must first demonstrate a clear understanding that the filmmaker's "great power" lies in her ability to tell compelling stories, employing the cinematic tools in her toolkit, much like a storyteller uses inflection, movement, facial expressions, and sound. This understanding of the filmmaker's "power" helps students get beyond the sensation of doing something "cinematic" simply because it "looks cool" or "feels right."

How can students at Georgia Tech learn to maximize cinematic tools?

I believe one of the best ways to learn how to make a movie is through practical application. In my classes, I guide students through all three phases of production, i.e., Pre-production, Production, and Post-production, emphasizing how decisions regarding cameras, lenses, color, light, and location, affect the storytelling of a film. We begin with several ideas before determining which challenge has the most creative potential. Since making a film is a collaborative effort, extensive class time is devoted to understanding the roles and responsibilities on a film crew, and to practicing how to effectively communicate as a crewmember. I also incorporate workshops on topics like Directing Actors and Producing a Short Film, as well as hands-on activities to allow students to gain confidence and familiarity with using Hi-Definition cameras, grip and lighting equipment, and cinematic lenses.

What types of opportunities are available to students interested in film at Tech?

The "Video Production" course explores the creative and logistical challenges of producing and filming an ultra low budget short film. Students can expect to complete a short movie, a commercial, a mini documentary, and/or a music video, while learning basic lighting, editing, field sound recording, and postproduction techniques. Occasionally however, we identify a single project that not only encompasses the course objectives, but also offers a significant challenge for everyone involved. For instance, last semester the students in "Video Production" competed in the Hyundai Lens of Loyalty Short Film Contest. Hyundai reached out to 25 different universities to develop and submit a one page treatment for a film that showcases "the football related traditions that inspires ever student who has walked those hallowed halls of higher learning." Georgia Tech was one of seven schools selected as a finalist, and awarded a $10,000 production grant to create a film. Preproduction for the Hyundai Project expanded two months for a four-day shoot that included two principal actors, three dozen background extras, six exterior locations, and Tech's beloved mascot, BUZZ. It was a student driven, interdisciplinary collaboration that involved LMC, Tech's Living History Program, the Tech Archives, the Athletic Department, the Tech Wreck Club, the School of Music, Institute Communications, and Tech's Legal Counsel. With the $10,000 production grant, the students were able to secure locations, hire talent, and rent equipment. It was indeed a fantastic real-world learning opportunity.

In addition, students in the Advanced Video Production course are given opportunities to work on Client Based Projects (CBPs). The Ivan Allen Col-

lege is keenly interested in collaborative opportunities that "define and solve problems, illuminate socially and ethically conscious strategies for positive action, and connect knowledge and expertise in the liberal arts." CBPs allow students to utilize the skills they obtained in previous courses to pitch, develop, and produce content for on-campus and off-campus organizations. Some of the previous CBP collaborators have included:

- The George W. Woodruff School of Mechanical Engineering: Students completed a promotional video for the 2012 Inventure Prize at Tech competition.
- The Women's Resource Center: Students created a documentary and promotional trailer for 2013 "Take Back the Night" event.
- The Graduate Student Government: Students produced a documentary, promotional video, and montage for the 2013 Georgia Tech Research & Innovation Conference.
- Roaring Lion Productions and MVMedia: Students came together to work on the Steampunk feature length film "Rite of Passage," which is written by Milton Davis and directed by Balogun Ojetade.

By critically exploring the planning, composition, and execution of a short film, students ultimately gain a better understanding of the artistic roles on a production crew and learn to master the creation of visually compelling and emotionally powerful images in a studio setting.

“The Computational Media (CM) degree is a unique degree at Georgia Tech, bringing together faculty from two very different disciplines to give our students a novel approach to thinking about computing. CM marries a traditional computer science education with a deep education in all aspects of the computer as a medium: the technical, the historical-critical, and the applied.”

Blair MacIntyre,
Professor of Interactive Computing,
Adjunct Professor of Literature, Media and Communication,
and Director of Georgia Tech’s Major in Computational Media

Narin Hassan

Cultural Exchanges/ Global Histories: Reading Mobility

When I moved to Atlanta in 2003, I was struck by how the city was being identified as "the capital of the new South," and a place of convergence for people and things. The Hartsfield Jackson International airport had recently been named the busiest airport in the world, and my new neighborhood was located just blocks from the center of the 1996 Olympic ceremonies. Georgia Tech was also in a period of transition and growth, and the School of Literature, Media, and Communication was evolving into a center for literature and science studies, an area that converged with my research and teaching interests. The Digital Media program, in its initial stages of development, was quickly being recognized as a distinctive new graduate program both within Georgia Tech and beyond. In 2003, as in 2014, this School was asking questions about what it meant to be innovative, how to prosper as a humanities department in a technical institution, and how to be a model for liberal arts education. As a new faculty member I found it exciting to be in a place that was willing to be flexible: one that could, in some ways, mirror the English departments I had been trained in, and in others be vastly different and open to change. LMC was the right "home" and a place where I—a nomad much of my life—could actually stick around for a while. As the child of diplomats, I grew up living internationally (eight different countries) for much of my childhood, and had lived in three U.S. cities before moving to Atlanta.

The work I do in LMC reflects that sense of movement and change while analyzing what it means to belong or be in a given place at a given time. Questions surrounding mobility emerge in the research and teaching I do in the fields of Victorian studies, postcolonial studies, gender studies, and medical humanities. The term mobility could imply movement, geography, and spatiality, but could also suggest absence, or placeless-ness—a lack of being rooted. Mobility could reference, among many other things, the vast "mobile technologies" that expand our notions of what it means to be a global citizen, and what it means to be situated in a given location. Mobility may connect to theories of space, to the circulation of textual or visual objects, to moving subjects, and imaginary and lived worlds, or be tied to geographical mapping and in turn to notions of home, of nation, and of travel. It could refer to the body—to physical movement—or to a lack thereof,

and to notions of freedom, or of immobility and enclosure. Mobility could also imply a "shift," a social or philosophical turn, or a global sensibility.
My research considers mobility in relation to imperial power, and to gendered identity and the formation of new boundaries and "contact zones." In my book *Diagnosing Empire: Women, Medical Knowledge, and Colonial Mobility* (2011), I trace the writing and work of nineteenth century women travelers in India and the Middle East to examine the relationship of women's travel to colonial medicine. I analyze the various material objects women traveled with—travel kits, journals, photographs, medical instruments and tools, to trace the movement of these objects in a circular way. In this work, examining the travel and movement of both objects and peoples reveals both imperial formations and the relationship of women to medical practices and scientific progress. In much of my research, I trace the circulation of texts and visual images as material objects as well—examining for example, the mass production of sensational and popular fiction in the nineteenth century as well as other forms of writing such as medical guides, domestic manuals, and gardening journals.

My recent work traces the mobility of commodities such as tea and the formation of early mobile technologies such as Wardian cases and glass conservatories, considering the interconnectedness of imperial and scientific progress within the domestic sphere. In the classroom, such research interests give students the opportunity to analyze documents like maps, published letters, and literary texts alongside visual images, architectural illustrations, and films. My teaching includes courses with a literary and historical focus, such as "Victorian Literature and Culture," and genre classes like "Studies in Fiction," and courses that consider the relationship of biomedicine and culture. A number of the classes I teach in the areas of gender and postcolonial studies address questions in the fields of cultural studies, anthropology, and sociology. While many of my courses consider cultural histories, my goal is to connect historical and literary texts to contemporary culture—considering for example, "Neo-Victorian" films, and texts, and cultural movements such as steampunk.

In all my work, mobility is not simply about expanded space or movement, but instead about the historical and cultural exchanges that emerge through interconnectedness—mobility is thus often tied not to absence and spatial distance, but instead to intimacy and new political and cultural relations. Thus, in newer research I trace the figure of the colonial wet nurse as an intimate and mobile figure of the European household, and consider new technologies of infant feeding and milk-sharing in relation to the circulation of bodily fluids and things. But for me, questions of intimacy, of bodies as mobile subjects, and material (and botanical) things as markers of an increasingly moving and mobile age, continue to infuse the practices of my research and teaching, and suggest to me that mobility—in all its shifting forms, can be a point of inquiry for work across disciplines and practices.

Nassim Parvin

Design, Values, and Democracy

I grew up in a closed and tense social and political atmosphere where censorship was an inseparable part of everyday experience. Since early childhood, I knew that I should not talk about certain books, music, or lifestyles outside of the close circle of family and friends. This experience made me deeply aware of the problematic nature of values in their ability to turn to dogmatic criteria for judgment.

Later, working as a design professional on multiple design and media initiatives, I observed the inseparability of values from what is said, done, or made. These initiatives were all, broadly speaking, human-centered, seeking to support people in their freely chosen activities. Yet each carried a subtly different vision of what it meant to be human-centered with important implications for design. For example, projects that were set in the disciplinary context of Human-Computer Interaction emphasized efficiency in fulfilling everyday tasks. In contrast, expression, creative exploration, and aesthetics were held paramount in projects that were set in the disciplinary context of Design.

The words of the eminent literary critic, Wayne Booth, were particularly resonant as I embarked on my doctoral research, and they still drive my research and teaching today:

Each work of art or artifice, even the simplest wordless melody, determines to some degree how at least this one moment will be lived. The quality of life in the moment of our "listening" is not what it would have been if we had not listened. We can even say that the proffered work shows us how our moments should be lived. If the maker of the artwork did not believe that simply experiencing it constitutes a superior form of life, why was the work created and presented to us in the first place? (*The Company We Keep: An Ethics of Fiction*, 1988, p. 17)

Set in the background of my personal and professional experience, my research is grounded on the premise that values are inseparable from what we say, do, or make; and driven by a deep awareness that dogmatic attachment to any set of values undermines free inquiry, conversation, and community. However, how might

one make sense of and thoughtfully design for the many actions and experiences that digital media could bring about and support? My thesis is that we can draw on the patterns of experience around digital and social media to inquire into values that drive their design; and that our understanding of both products and values is developed through the processes of making, use, and criticism. I am particularly interested in values of participation, democracy, and diversity that are dominant in popular and scholarly discourse around digital media.

In 2013, I established the Design and Social Interaction Studio, a design studio that brings together an interdisciplinary group of faculty and students. In the studio we examine the experiential and participatory dimensions of digital media and their relationship to supporting participatory and democratic forms of social interaction. We design and investigate a variety of products such as locative media; interactive visualizations and mapping; awareness campaigns; social and civic media. These design projects enable us to investigate the plural interpretations of values such as 'participation' and 'democracy' understood as hypotheses that form and inform the design and criticism of digital media.

For example, students and faculty in the studio are engaged in an interdisciplinary research project entitled Sweet Auburn Digital Media Initiative. Among the aims of this project is to establish theoretical and practice-based evidence for how community engagement is initiated, supported, and developed through the mediation of locative participatory media. Set in the Sweet Auburn Historic District in Atlanta, we are designing media experiences to raise awareness about the area's important cultural heritage and invite engagement with issues of local concern and interest. Through these applications we seek to highlight and preserve the important history of the neighborhood as a vital center of community, innovation, and commerce among African Americans and the center of the Civil Rights Movement during the era of segregation. We bring together and share stories of individuals and collectives that highlight the complex and multiple histories of the people and places in the district and connect it to the current preservation and revitalization efforts in the neighborhood. One of the key characteristics of this research is an innovative integration of ethnographic and collaborative methodologies to involve a diversity of individuals and groups in the design process, leading to the design of an inclusive and engaging digital environment for storytelling, civic discourse, and grassroots social change.

I left my country for the US in the early 2000s. Those were the early days of satellite TV and the Internet there, giving access to information and opening up the society in important and promising ways. I was enthusiastic about becoming an active contributor to the design of information technologies. I am still optimistic that we can design human-centered technologies that contribute to the development of inclusive and pluralistic societies. However, my enthusiasm is accompanied with great caution that in the absence of critical and humanistic perspectives, our technologies will enslave us, becoming tools for propaganda and oppression as opposed to democracy and positive social change. This is why I am excited to be a part of the LMC family educating future designers and scholars that bring a humanistic perspective to our increasingly technological world!

Gregory Zinman

Seeing the World Anew: Studying Experimental Media at Georgia Tech

In late 1964, artist and musician Tony Conrad began planning his first film. Working from paper diagrams, he spent the next several months mathematically mapping out patterns of alternating black and white frames that he hoped would produce a hypnotic strobing effect when projected. A friend lent Conrad a camera, and Conrad shot the film quickly. The white frames were made by photographing a white sheet of paper. The black frames were made by pressing the shutter with a cap covering the lens. Conrad spent the next eight months painstakingly editing the film with an 8mm splicer. At the same time, he also built his own audio synthesizer to make the soundtrack, a rumbling, rattling clatter that both mimics and accentuates the whir of a film projector. He showed the film for the first time in 1966.

When the film began, viewers saw a hand-drawn title card that, with some strain, could be read as introducing *The Flicker*. Then, they saw a second frame, this one warning that sufferers of epilepsy should avoid seeing the film. Then, the film really started. The black and white frames alternate in slow pulses. As the 30-minute work progresses, the pace picks up. Eventually, the film provokes something like an alpha state in its viewers. Unable to physically process the rapid visual changes between black and white, they begin hallucinating. Viewers report seeing mandala-like pinwheels, three-dimensional effects, and a variety of colors. That is, watching the film prompts viewers to *produce* images from their eye rather than merely receive them.

I show this film in nearly every class I teach at Georgia Tech. *The Flicker* is a radical reduction of cinematic form that produces maximum effect. In doing so, the film offers a host of formal and conceptual rubrics central to the study of experimental media. The seemingly simple work, which on its surface reads as an exercise in cinematic formalism, was engineered through a process of iterative design, steeped in studies of both math and perceptual psychology. The film is largely unexplainable without a discussion of the function and mechanics of the cinematic apparatus. Its historical context invites investigations between the era's burgeoning psychedelic culture and the art world's simultaneous embrace of minimalism. Its production highlights the intense labor that often accompanies artistic creation, and it foregrounds experimental media's alternative modes of production—low budget, made by an individual rather than a crew of hundreds or thousands, a dramatic rejection or rethinking of narrative and representation, and a questioning of both the

function and aesthetics of media and its accordant technologies.

"But what does it *mean*?" ask my utterly bewildered and occasionally delighted students once the lights come back on and their overwhelmed sensorium once again achieves equilibrium. What follows is usually a lively discussion regarding viewer agency and questioning the nature of what exactly constitutes an image—whether it appears on a screen or emanates from one's own mind. We talk about the value of art that challenges, that provokes, how artists seek to see the world anew, and in the process, convey a sense of how and what the world could be, if we thought about it/saw it differently than we did before. Eventually, students realize that *The Flicker* doesn't have a meaning—it has many.

This is the central value of teaching experimental media at an institute of technology, where many students become accustomed to the expectation that there is one correct answer to a question—say, "C" and not "B," on an electrical engineering exam. Experimental media helps students understand that many questions, especially questions that they may encounter once they leave college—questions of politics, ethics, friendship, belief, love, finance, and family, are not easily pinned down. The answers they prompt are often complex, ambiguous, multifaceted, and polyvalent, and some might even be unanswerable altogether. Experimental media conditions students to get comfortable with this ambiguity, with taking chances, and with not knowing. In our current political and media climate, it is imperative that we give our students the critical skills that will allow them to understand—and to

In my work as a curator, I present works of experimental film and media in a variety of settings—from local microcinemas to major museums. I address different audiences by writing for exhibition catalogs as well as for outlets such as The New Yorker and The Atlantic.

question—the kinds of images and information coming their way, as well as model the modes of inquiry that enable them to learn more about the sources and the systems that those images are embedded in. I see the study of experimental media as granting students the knowledge and skills that will enable them to rethink and remake the world.

This work not only educates students; it can also reach a larger public. In my work as a curator, I present works of experimental film and media in a variety of settings—from local microcinemas to major museums. I address different audiences by writing for exhibition catalogs as well as for outlets such as *The New Yorker* and *The Atlantic*. My scholarly book, *Making Images Move: Handmade Cinema and the Other Arts*, finds connections between hand-painted film, kinetic sculpture, psychedelic light shows, and abstract video synthesis. I've also edited the writings of Nam June Paik, the father of video art, enabling his self-account of his artistic process to reach a wider readership. Most recently, I served as a technical consultant on *Ad Astra*, a Brad Pitt-starring science fiction feature from 20th Century Fox. In that role, I helped director James Gray envision new ways of seeing space by providing him with examples from artists and experimental filmmakers. It's a reminder that experimental media and mainstream entertainment do not exist in entirely separate camps—they visit each other more often than we might think.

I delight in seeing the results of students energized by experimental media, when that flicker erupts into a blaze of inspiration. Final projects in my classes have ranged from the creation of a biometric video synthesizer to the production of a multi-part Vine film, and from the designing of an abstract video game to the construction of a web-based project analyzing the relationship of hip-hop to the avant-garde. I also encourage students to share their work outside the classroom: one recent student had her project on vanity and surveillance selected for an institute-wide art exhibition at the university. Throughout the process of watching, teaching, and learning, I take pleasure in exposing students to new ways of seeing—both through my eyes as a scholar of the moving image, and through theirs as inhabitants of today's visual culture.

THIS SHARED DREAM

KATHLEEN ANN GOONAN

"A tough-minded, kind-hearted, fiercely intelligent novel."
—Ursula K. Le Guin

Kathleen Ann Goonan

Science Fiction, Writing Fiction, and Understanding the History and Social Impact of Science and Technology

The literature of science fiction, which I have been publishing, writing, and speaking about since 1990, examines the ways in which science and technology have changed or may change our most deeply held ideas of what it means to be human. As our possibilities expand, SF invites readers to think about not only the future, but also the past and the present, in a new light. The literatures of SF mirror our hopes and fears through storytelling, one of our oldest tools. A chameleon that can assume the form of any literature, SF is a vibrant spectrum of perspectives, bridging the "two cultures" of science and the humanities. Extrapolating from the known, it introduces new vectors of imagination to our cultural discourse, inspiring entertainment, inventions, and even careers; many scientists and engineers cite SF as their inspiration. SF manifests not only in narrative fiction, poetry, film, television, digital media, and performance art, but also in commercials, design, and news. It is a way of thinking rigorously, and, often, lyrically, about how nanotechnologies, the neurosciences, materials research, environmental studies, mathematics, architecture—in short, everything that Georgia Tech's rich environment offers—may affect us and our environment in the short as well as the long term. LMC includes science fiction-related classes in which students can rigorously explore these perspectives as well as learn to create new, technologically informed science fictional worlds that have the potential to be commercially viable.

The School of Literature, Media, and Communication, with its wealth of scholars and tech-savvy students, is a vibrant community that erases the illusory divide between science, technology, and the humanities by showing that they are not mutually exclusive aspects of who we are, what we can know, and how we can know it. When our technological environment, whether it be past, present, or future, is observed from this point of view, all literatures, including the narratives of science and the material manifestations of technological thought are understood as being a part of the same creative continuum of human vision and accomplishment. LMC's situation in a great technological university imparts to LMC/STAC students an environment in which they can experience science, technology, and the arts not as "two cultures" but as a single endeavor

that manifests in a wealth of languages, all of them human and understandable. This humanizing approach to technology helps students learn that, in our technological society, those in the humanities can and do play vital roles in the international community of creative, visionary artists, engineers and leaders.

LMC's humanistic perspective examines the history of science and technology through the arts. Artists, writers, playwrights, poets, and musicians are often the first, as our bards, to interpret and show how technologies change culture, and how cultures birth technologies. Émile Zola, the Impressionists (with their darker, oft-ignored visions of technological change), Virginia Woolf, T.S. Eliot, Kandinsky and other Modern painters, Fritz Lang, Aldous Huxley, Arthur C. Clarke, and many others come to mind immediately as artists who spoke directly about how technology impacts us. Close scholarly investigation reveals that culture is inextricably intertwined with technology, and that reading Chaucer, Shakespeare, or Herriman (Krazy Kat) from a technologically situated perspective not only imparts depth and richness to that study, but gives students the paradigm-changing understanding that the arts , science, and technology are not separate human endeavors, but are instead the deeply connected continuum of thought and action that is our astounding human inheritance, which we are privileged to understand , join, and influence.

Artists, writers, playwrights, poets, and musicians are often the first, as our bards, to interpret and show how technologies change culture, and how cultures birth technologies.

I teach Creative Writing (which I prefer to call Writing Narrative Fiction), the Science Fiction Novel and Short Story, and classes about the history of science and technology that examine how a once-radical method of viewing reality—science—emerged, how it came to inform our present culture, and what it means for individuals, society, and our future. I endeavor to expose students to the diverse individuals who fueled discovery, technological advances, and cultural movements, as well as those who interpret or extrapolate fictional futures or the present in science fictional ways. In this way, not only will students better understand the forces that shape the present, but they will also be better able to see themselves as potential innovators and leaders in any environment that they find themselves in, or that they choose to create.

In one such class, I used biography to teach the history of science, technology, and culture. Students read and discussed biographies of Charles Darwin (*Darwin: The Life of a Tormented Evolutionist*, Desmond and Moore), Lise Meitner (*The Dawn of the Nuclear Age*, Rife) Alfred Loomis (*Tuxedo Park*, Conant), Richard Feynman (*Genius*, Gleick), Fran-

cis Crick (*What Mad Pursuit,* Crick), and Eric Kandel (*In Search of Memory*). They thereby gained an understanding of how individuals can radically change intellectual paradigms through curiosity, perseverance, and commitment to a particular path. In "From the Earth to the Moon: The Sixties," a Senior Capstone class, students created projects based on their deepened understanding of WWII, the Cold War, the refinement of rocket technology, NASA, the Space Race, the Civil Rights Movement, the Kennedy and King assassinations, Vietnam, Feminism, student mobilization, and so many other aspects of that crowded decade of change that we could only touch fleetingly on some of them.

For admission to the creative writing class, I request that students submit a five-page sample of their narrative fiction in ordered to be considered. I do not evaluate the samples for any quality other than that of assembling a group of people who show enthusiasm for writing stories or novels. The result is a mix of SF, fantasy, literary mainstream, and personal narrative; storytelling takes many forms, and none is privileged over others. The class has included students who had taken master's courses in fiction writing as well as students who are just beginning, yet they all benefit from and contribute equally to the workshop format. The work of the class is twofold: students must write and submit two short stories (or a limited segment of a novel), and must also closely read and critique the work of fellow writers. The latter aspect of the course is probably the most instructive. Because each class consists of oral critiques of every story, learning takes place in class, when writers hear how others view the same work in various ways, and learn why. Eventually, an invisible cohesion, a fellowship, emerges, and some writers continue to workshop after the class ends. I encourage all students to submit their work to journals, contests, and paying markets. Thus far, we have had one honorary mention in an important writing contest and another student who won a large monetary first prize in "The Future—Powered by Fiction" Tomorrow Project.

I sold the first of about fifty published stories in 1990. *Queen City Jazz*, my first novel of seven, was a *New York Times* Notable Book. *Crescent City Rhapsody* and *Light Music* were Nebula Award finalists, and *In War Times*, which combines my father's memoirs with an alternate history that rests on the very real developments of the cavity magnetron and radar and intertwines them with bebop, won the John W. Campbell Award. I have given invitational talks at Rochester State University, the University of South Carolina Center for Nanotechnology, the Library of Congress, Idaho State University, the Global Competitiveness Forum, at international literary festivals such as Kosmopolis in Barcelona and Utopiales in Nantes, for DARPA, and elsewhere. I speak about issues that I explore in my fiction—the implications and impact of nanotech, the future of education, consciousness and memory research, attempts to unravel the basis of the human predilection for war, post-and-trans humanism, the possibilities of genetic engineering, and, frankly, anything that captures my interest so strongly that it leads to the deep research that, eventually, manifests as fiction.

As a professional author, a large part of my excitement at being at Georgia Tech is the opportunity to provide an intellectual and creative environment in which students can experience, through critiquing, revising, and submitting short stories, the broad stages of writing fiction in a critical, yet supportive and practical environment. Whether or not one

has the dream of someday publishing fiction—although I doubt that any creative writing student does not have this dream—the process of producing a work of fiction creates ways of thinking that are useful no matter what career one undertakes. Taking imaginative leaps is a part of the scientific and engineering path. Through writing and workshopping stories with a beginning, middle, and end, students learn that they have the authority to make those leaps, to devise their own rules and parameters, and that they can hone their ability to write fiction that others take seriously. Immersion in the art and craft of writing fiction is the perfect realization of "humanistic perspectives on a technological world."

I am delighted to have the opportunity to work with the extraordinary students at one of the country's top technical and engineering universities, both as an expert in the field of science fiction, and as an author.

Communicating as a Professional

Rebecca E. Burnett,
Lisa Dusenberry,
Andy Frazee,
Joy Robinson,
and Rebecca Weaver

What do accountants, architects, astrophysicists, biomedical engineers, computer scientists, economists, mechanical engineers, NGO organizers, and military officers have in common? All create and interpret technical communication—written documents, oral presentations, and visuals. What do the silicon chips, prostheses, wetlands conservation, robotics, food banks, and solar panels have in common? All are subjects of technical communication, a broad field that touches every profession, connecting ideas, people, and actions.

What should students expect to learn?

Students who take technical, business, and professional communication at Georgia Tech (LMC 3403, 3431, 3432) become more effective communicators as they develop individual and collaborative communication strategies. They learn principles underlying communication as well as practical processes and strategies that work in their Georgia Tech courses, internships, and co-ops. They also learn processes and strategies that will be valuable for them in future professional careers, whether in non-profit organizations, entrepreneurial startups, big business, traditional industry, research facilities, government agencies, or hospitals.

The sidebars in this chapter describe projects typical of those in technical communication. The first sidebar provides an example of a project in which

Creating Adaptable Communicators

Georgia Tech students enter a marketplace that expects them to not only develop purposeful content but also to effectively design and present it using software tools. To be successful, students must learn how to approach unfamiliar projects and become effective communicators who adapt their knowledge and tools to reach specific audiences.

One project that helps my students build these competencies is a multimodal software demonstration video with accompanying written instructions. To create the demo video, each student learns the major features of a particular software application and selects the most beneficial and provocative ones. Then students script, record, and edit screencasts that discuss the software's usefulness and usability. To complement the video,

students create software demonstration videos with accompanying written software instructions. While demonstration videos and instructions are important genres in the workplace, this particular project is equally important for the processes students learn. Whatever the specific assignment, rhetoric, process, and multimodality are central in our technical and business communication courses.

Rhetoric. Students learn to use the synergy among rhetorical factors (e.g., context, purpose, audience, argument, organization, evidence, visuals, design, and conventions) in creating written, oral, and visual artifacts for diverse professional audiences and situations. They learn that some technical, business, and professional communication is formulaic; for example, a monthly memo reminding employees about the regular staff meeting may remain virtually the same from month to month, with simply a change in date, meeting room, and list of topics. However, the majority of the course focuses on difficult communication problems. For example, while the final report about a long-term project may include a formulaic title page and table of contents, the heart of the report addresses the challenges and successes of the particular project. A formulaic approach to this more difficult communication task would be inadequate (and unprofessional).

The infographics sidebar in this chapter describes the importance for students to learn not only rhetorical conventions related to language but also rhetorical conventions related to numeric data. Students learn to transform data into visuals that can tell a story meaningful to the audience. The sidebar explains a project in which students produce formal written instructions for creating something using their software (like detailed maps with GIS data in Adobe Illustrator). Producing screen-casts for a demo video and for written instructions challenges students to strategically select the appropriate language and level of detail for each.

Overall, software demonstration videos help students learn how to approach something unfamiliar, develop complex projects, and hone artifacts for visual and verbal impact. Students gain empathy for their audience members as fellow learners. Taking tech comm helps my students become adaptable communicators who use dynamic writing and design strategies and, as a bonus, have a library of software resources at their fingertips.

Lisa Dusenberry, PhD (University of Florida), Marion L. Brittain Postdoctoral Fellow

Specializations: Children's literature, digital media, and business/technical communication

Infographics: Using Visuals to Present Information

Professionals need to know how to use visuals (e.g., bar charts, graphics, images) accurately, appropriately, and ethically to represent and describe data. Once information is collected and constructed into a display, it can be repurposed in later reports, proposals, and presentations. Many students understand how to make a bar chart or line graph, but when and where to use visuals and how they contribute to an argument or "story" is more difficult.

students created infographics and then used the new design strategies to improve visuals in technical reports.

Processes. Students in technical, business, and professional communication learn processes that move them beyond their first-year composition courses (e.g., learning to create, plan, draft, design, rehearse, revise, present, and publish) in developing both individual and collaborative projects. They learn much more about project planning and scheduling, often creating Gantt charts and figuring out ways to balance individual contributions to collaborative projects, considering group member's applicable knowledge as well as available time.

Equally important, students learn the processes involved in standard workplace communication practices such as usability testing. For example, in one recent tech comm class, student teams tested a mobile app from the Red Cross, which involved establishing a testing protocol, inviting and scheduling test participants, and engaging in various roles during the testing (e.g., facilitator, note taker, technician, observer, video recorder). Each team then turned its data into a comprehensive usability report and presentation for the client, detailing recommendations for changes.

Students develop confidence in using a research-based approach to workplace communication, including refinement of expectations about communication processes. They often work with actual clients in service-learning projects. For example, the sidebar about engagement with language describes a client-based project in a recent course. Students redesigned the newsletter, website, and social media presence for the Community Ad-

In my tech comm course, one particular assignment helps students better understand and apply visual concepts. This assignment expects students to examine their rhetorical choices in visually representing data; to use reader-centered organization, style, and language in selecting types of visuals and design; and to summarize important information using design techniques such as chunking, scale, and proximity that are generalizable to many communication situations, including reports and presentations.

This final assignment is an infographic. In class, we approach this individual assignment in phases, including a group critique and a remix of an existing infographic using low-tech tools (white boards, markers, scissors) emphasizing that effective presentation of ideas is not dependent on digital technology. The students' final, original infographics are printed for display in the classroom and accompanied by a written text (later incorporated into a report) and a brief oral presentation.

Joy Robinson, PhD (Illinois Institute of Technology), Marion L. Brittain Postdoctoral Fellow

Specializations: Usability testing, information design, instructional design, and online pedagogy, business/technical communication

Thoughtful Engagement With Language

For me, the heart of technical communication is a commitment to thoughtful engagement with the power of language. Students in my tech comm classes develop competence in communicating to audiences, meeting deadlines, synthesizing materials and information, and building effective and meaningful communication practices.

vanced Practice Nurses' Clinic, a non-profit medical clinic serving Atlanta's homeless.

Multimodality. Whether people are working individually, collaboratively, domestically, or internationally, a WOVEN (**W**ritten, **O**ral, **V**isual, **E**lectronic, and **N**onverbal) approach to technical, business, and professional communication emphasizes workplace realities. Virtually all workplace communication is in some way multimodal and in some way collaborative. In fact, try to imagine preparing an important professional oral presentation without writing (for example, text that goes on notecards, handouts, PowerPoint slides, or flip chart sheets). Try to imagine preparing the same oral presentation without visuals (for example, objects for demonstration or images on slides or handouts). And try to imagine preparing the same oral presentation without considering the nonverbal elements (for example, the way the speaker looks and sounds, the lighting in the room, and the way the chairs and tables are arranged). Similarly, try to imagine preparing the same presentation without any collaboration—that is, without talking with anyone or consulting on print or online materials during the preparation, without asking anyone to review the presentation materials or give feedback about a rehearsal.

What are typical projects in a tech comm class? Students can expect to find a combination of multimodal artifacts—written, oral, and visual. In completing projects during a semester-long course, regardless of the particular section in which they're enrolled, students will create several of the artifacts listed in Figure 1. While these do not represent all possible artifacts in the workplace, they are typical of those professionals may be expected to complete.

Developing these competencies is especially important for my tech comm class focusing on community engagement. A recent client was the Community Advanced Practice Nurses' Clinic, a non-profit medical clinic serving Atlanta's homeless. The clinic needed help redesigning its newsletter, web-site, and social media. The tech comm students wrote and responded to emails, executed a website usability study, conducted evaluations, and wrote about best practices for social media and newsletters, while concurrently investigating larger issues of importance to our project such as the politics of healthcare, uninsured populations, and digital non-profit communication and giving. Students had an actual audience providing feedback to their work, and they had to respond adequately to the client's needs and preferences. Students learned ways in which teamwork, problem solving, feedback, and revision can happen in professional settings.

Students' final semester projects included three elements: presentations to clients, instruction manuals for the clinic, and student portfolios, which included written reflections, correspondence, and drafts of client material. The presentations demonstrated the students' impressive growth in their professional use of written, oral, visual, and non-verbal communication.

Rebecca Weaver, PhD (University of Minnesota), Marion L. Brittain Postdoctoral Fellow

Specializations: Poetry community discourse analysis, American literature, discourse and writing in universities, history of higher ed, digital humanities, digital pedagogy, multimodal composition, creative writing

Correspondence (e.g., letters, memos, email, phone calls, conference calls) Instructions, procedures, and troubleshooting guides Interviews (e.g., interviewer, interviewee, job, information) Job application packets (organizational analysis, cover letter, resumes, responses to conventional interview questions) Manuals (e.g., policies, tasks, operations)	Marketing campaigns (e.g., radio spots, brochures, billboards) Meeting management (e.g., agendas, minutes, Skype, Hangout) Memos of understanding Oral presentations (e.g., Pecha kuchas, training demos, teams) Posters (e.g., safety, scientific) PowerPoints and Prezis Press releases Project planning (e.g. Gantt charts) Proposals (both solicited and unsolicited)	Reports (e.g., analytical, progress, recommendation, trip, usability) Social media presence (e.g., blogs, Facebook, LinkedIn, Twitter) Visuals (e.g., types, including tables, graphs, maps, diagrams, photos; titles, captions, and in-text references) Videos (e.g., training, documentary, surveillance) Websites (e.g., marketing, organization) White papers

Figure 1. Typical artifacts created by students in technical communication classes

•***Accuracy matters***—Is everything correct? No exceptions.

•***Conventions matter***—Are written, oral, visual, and nonverbal conventions respected? So, for example, all misspellings and grammar and punctuation errors must be eliminated. Words must be pronounced conventionally. Mislabeled graphs and distorted figure scales must be fixed. Design conventions apply to both print and digital artifacts.

•***Accessibility matters***—Can the audience access the information, technologically as well as physically? The print needs to be large enough for audience to see the information. The sound needs to be audible and crystal clear. The digital links need to work.

•***Comprehensibility matters***—Does the information make sense to the intended audience? The vocabulary and images explaining the concepts must be adapted to the intended audience(s). The argument must be logically presented and well-supported with credible, well-documented evidence.

•***Usability matters***—Is the information usable? Just because a document or website is accurate and attractive doesn't mean it is usable for the intended audience. Can users find the information they need? Is the navigation clear and easy to use?

Figure 2. Criteria for successful artifacts in technical communication

The assignments and projects in tech comm have evolved as workplace communication needs and expectations have changed. Workplace communication virtually always is multimodal and collaborative in its planning, drafting and/or revising. Students learn standards that apply to professional communication. So what does this mean in practical terms? The questions and explanations in Figure 2 are at the heart of the course. Simply put, professional communication is deemed successful if it is accurate, conventional, accessible, comprehensible, and usable.

“The limits of a society disproportionately driven by technocratic logics that mistakenly assume that qualitative concerns are somehow fully embedded in quantitative measures are starting to surface in both highly visible and subtle ways. This is happening in parallel with, and in many ways connected to, a growing distrust of higher education and its association with expertise knowledge of how to address society’s most challenging problems. Perhaps the core of this distrust is not about the actual knowledge and expertise, but rather the presumptive manner in which it has been disseminated into society. Overcoming this is not a technical or scientific problem to be solved, it is a cultural and humanistic attribute to be more thoroughly understood. Preparing the next generation for this challenge is the hard work of a program like LMC and one that is growing in urgency.”

Scott Marble, Chair, School of Architecture

Yanni Loukissas

The Map Room Project: Making Places for Thinking Critically about Data

In a Georgia Tech lab space in Midtown Atlanta, under the illumination of a digital projector mounted overhead, undergraduate students are exploring data about recent changes in the physical and demographic makeup of their city through an exercise in map-making. However, their drawing instruments are not what you might expect of digital media. Rather, they are markers, pens, and paint applied to an oversized stretch of white paper, sixteen feet long by four feet wide. The projection is driven by sophisticated, custom mapping software, but it does not dictate the way that students mark up their map. Rather, students must negotiate between the projected data and what they personally know about Atlanta through their own lived experiences.

These students are learning to think critically about data— how to approach unfamiliar sources both effectively and ethically—in the Map Room, a new project currently housed in the Local Data Design Lab, where I serve as the faculty director. The educational mission of the Map Room, which has evolved out of a collaboration with data artist Jer Thorp, is to support creative and collaborative explorations of civic data, and to help people reflect upon and revise the stories that data tell about their lives and the places they live.

The project is an example of how critical thinking, one of the traditional goals of a humanities education, might be applied to digital things. Educators have long debated how to best teach critical thinking. Many credit the American philosopher John Dewey with setting the modern foundation for critical thought in his book How We Think, originally published in 1933. Dewey uses the term "reflective thought" to characterize the "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends" (Dewey, x). Much about this approach is still relevant.

However, today in 2019, during a period of rapid social, economic, and environmental changes in the United States—many of which can only be seen through "big data," data at a scale unimaginable in Dewey's era—it is

time to revisit some of our basic assumptions about what critical thinking means. We have so much data today that we can scarcely see it all without the use of software. Unfortunately, most of our contemporary software tools are black-boxes; they are inscrutable in the way they work. Moreover, these tools encourage us to treat them as universal instruments for reasoning, regardless of the data, their origins, or their users.

Thinking critically in our data-driven society means, in part, following Dewey's suggestion that we consider new forms of knowledge, such as data, "in the light of the grounds that support (them)." We can approach these "grounds," quite literally, by contemplating data in terms of their locality: where they are created and used. Indeed, thinking critically about data means challenging what anthropologist Anita Chan calls the "myth of digital universalism," which prevents us from considering how data might mean different things in different places.

This approach to critical thinking owes much to scholarship in science and technology studies as well as feminist theory, both of which have sought to demystify the black boxes of technoscience by revealing how all forms of knowledge are situated in their own local conditions. For example, Barbara Thayer-Bacon challenges previous models of critical thinking with her concept of "constructive thinking." She writes "as a model for thinking, it stresses the impossibility of separating the self from the object, the knower from the known." (Thayer-Bacon, 6) Updating Dewey's conception of reflective thought accordingly would mean expanding his notion of "grounds" to something beyond the first principles of logic. The grounds that support our beliefs about data are personal, as well as material and social.

In following, the Map Room offers a new set of conditions for critical thinking: First, the Map Room is personal. Data do not speak for themselves in the Map Room. They are interpreted and transposed

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onto paper maps by people who must consider the data in relationship to their own personal knowledge and values. Second, the Map Room is material. In the Map Room, people use making to enhance their thinking. They engage their hands, indeed their whole bodies given the large size of the maps, as well as a range of traditional and digital technologies for map-making. Third, the Map Room is social. Unlike most mapping software, people are not meant to use the Map Room alone. They must coordinate with others by making space for a range of responses to the data—including responses from collaborators who might have different ways of thinking about the data being mapped.

Over the next year, the Local Data Design Lab will be working to foster the development of Map Rooms in a host of other cities. As the project moves into new contexts, we are expecting that it will need to adapt. In order to support critical thinking in unexpected local conditions, we are imagining the Map Room as a flexible framework rather than a rigid platform. Resistance to the myth of digital universalism requires that the nature of critical thinking about data not be generalized. Thus, the Map Room project seeks to empower local communities as they shape their own effective and ethical interpretations of data.

In order to support critical thinking in unexpected local conditions, we are imagining the Map Room as a flexible framework rather than a rigid platform. Resistance to the myth of digital universalism requires that the nature of critical thinking about data not be generalized. Thus, the Map Room project seeks to empower local communities as they shape their own effective and ethical interpretations of data.

Anne Sullivan

Stitching Together Crafting and Computing

"Why quilting?"

I am regularly asked this question when I discuss my research on the intersection of interactive storytelling, craft, playful interactions, and computers. The answer is almost as messy as my craft room; there are many reasons.

Because textiles are one of the oldest forms of storytelling

One of the active research areas in Interactive storytelling focuses on the development of artificial intelligence to help increase players' involvement with stories in games and other interactive experiences. Approaches range from story creation to improvisational story adaptions based on players' choices. There have been great innovations in this area, but the focus is often on the adaptation of stories that already exist in games. This allows prevailing power structures to determine what stories and games are worthy of study, play, and writing, in turn intensifying the silencing of BIPOC storytellers, women, and LGBTQIA+ communities.

In contrast, women in many cultures have been using textiles for centuries to share their stories and using textile crafting as a way to meet and share. In America, quilting bees allowed women to meet regularly and talk about their lives, communities, and politics without the presence of their husbands. This independence was a rarity at a time when men made all the financial and political decisions, and historical quilts show the influence of that cultural context of their time, giving us insights into the women who made them.

In turn, by studying quilting, we can learn the stories and values of these communities and incorporate them into our game designs and artificial intelligence tools, amplifying the voices of those who have been historically oppressed.

Because creating and designing quilts has a lot in common with programming

In many ways, craft patterns and recipes are programs, but they're meant for people instead of computers. Exploring this more deeply, quilters use many methods that are similar to those used by programmers, such

as: abstraction, loops, conditionals, optimization, and serialization. Because of this, quilting has been used as a metaphor for teaching computational concepts. However, the majority of the work has been done in the context of K-12 education, with very little research being done around adult education.

In the Code Crafters project—done in collaboration with Worcester Polytechnic Institute—our research explores how this metaphor might extend to intergenerational groups of already skilled quilters outside of formal learning environments. In our research we've found that quilters highly value creative expression and community. In response to this, we've created an application that uses artificial intelligence to create quilt designs in collaboration with the person using the tool, while also allowing quilters to easily share and build from each other's designs and see what others are creating in real-time. The application is being used in workshops designed to teach computing concepts while quilters also use the tool.

One of the major threads to come out of this work is the importance of incorporating the values of the people who will be using these applications. In much of computer science education, the goal is to teach people how to think like computers. We challenge this by asking: What if we make programming languages and tools that meet people where they are instead?

Because quilts can help us visualize different types of data

In her poetry course, Dr. Farris faced a challenge with teaching meter—it takes time for students to gain the skills necessary to easily hear the stresses in a poem, but students need to understand how meter is used in poetry before they have mastered those skills.

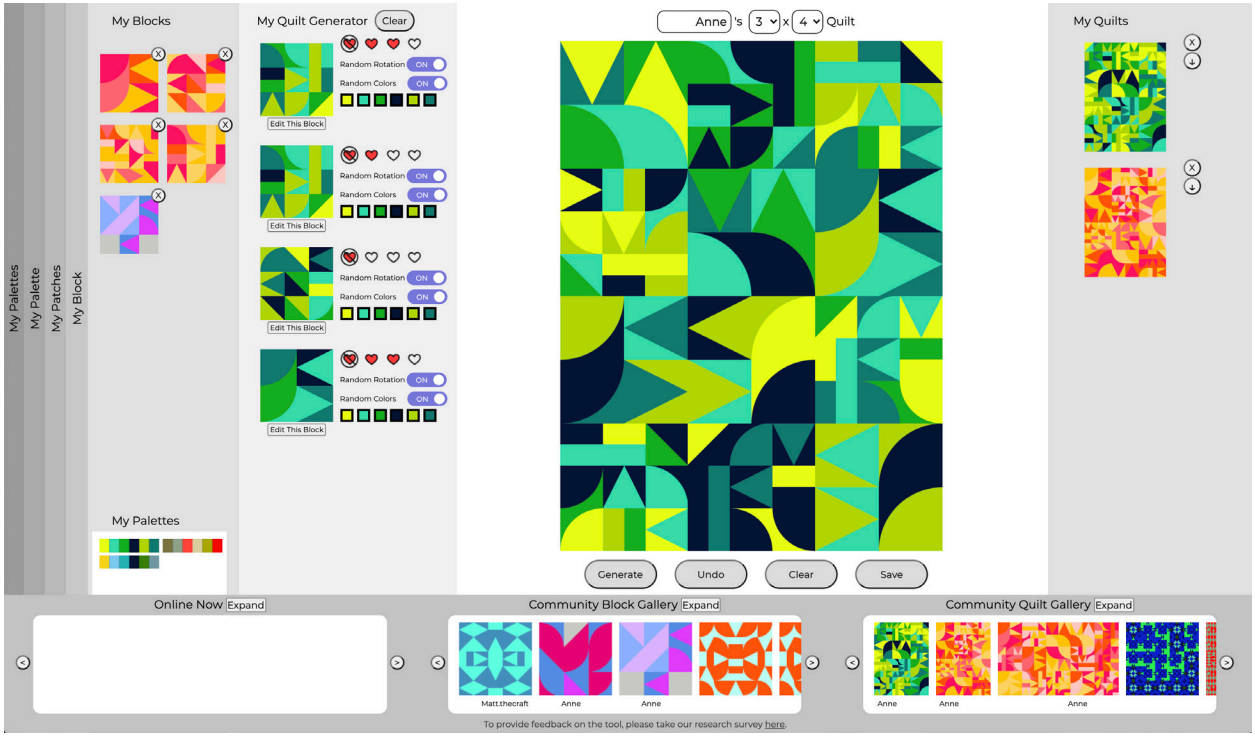
Quilts also use rhythm and visual repetition. Working together, Dr. Farris and I mapped different poetic feet (repeating units of stressed and unstressed syllables) to different quilt blocks, allowing us to create quilt designs that visualized meter in those designs. When Dr. Farris used the visualizations in her course, students were able to see meter, which allowed them to learn how to hear it more easily.

Based on our initial quilt visualizations, we created the Patchwork Poetics application. When a person enters a poem, the

artificial intelligence generates a quilt design that represents the meter in the poem. Because there is more nuance in poetry than what a computer can understand, the application also allows people to experiment and modify what the computer suggests. Removing the "blank canvas" aspect of analyzing a poem and using an intuitive interface also has the benefit of making this activity much more playful.

Because you felt the need to ask that question

No one asks why computer scientists might study robotics, warfare, or rocketry. The connections between these fields are actively researched and widely accepted. Even though strong connections also exist between computer science and crafting, they are under researched and generally unknown. It's unlikely a coincidence that the fields most actively studied in relation to computer science are also predominantly populated by men. So, until these connections become so commonplace that no one ever feels the need to ask, "why quilting?," my research will continue to explore the rich and fascinating world that exists in the space between crafting and computing.



I am convinced that our students, with their strongly interdisciplinary curricular focus, are particularly well prepared to investigate “medievalist” as well as “neomedievalist” narratives, and Atlanta, Georgia Tech, and particularly LMC provide the perfect intellectual lab spaces to do that.

Richard Utz

Past, Present, and Neo

The past is never dead. It's not even past.
William Faulkner

Cypher: What happened?
Neo: A black cat went past us, and then another that looked just like it.
Cypher: How much like it? Was it the same cat?
Neo: It might have been. I'm not sure.
The Matrix (1999)

At first sight, few cities could have less of a link with the Middle Ages than Atlanta. Founded in 1837 to provide a train terminus to connect the port of Savannah with the Midwest, and about 3,500 miles and 400 years removed from Old Europe, Georgia's capital seems to be quintessentially modern. Nevertheless, an alert first time visitor might notice a whole host of medieval signposts:

At the airport's baggage claim, a colorful screen display invites her to be "swept away to an age of bravery and honor" and partake in "a feast of the eyes and appetite with all the splendor and romance" of medieval Spain at the Atlanta Castle of Medieval Times, a dinner theater chain. A courtesy van, which treats her as if she were a noble lady at a medieval court, takes her to her downtown hotel, the Knights Inn. After a change of clothes, she takes a taxi to the Catholic Cathedral of Christ the King, where she attends her college roommate's wedding, which includes the celebration of the Eucharist, a sacramental ritual originating in the Fourth Lateran Church Council's decision on transubstantiation in 1215. She is especially impressed by the performance of members of the Atlanta Early Music Alliance, who perform wedding songs from before 1800, accompanied by instruments made according to medieval and early modern building instructions. On her way out of the Cathedral, a Knights of Columbus honor guard greets the guests who are then bused to the wedding reception at Rhodes Hall on Peachtree Street. There, our visitor admires the Victorian Romanesque revival architecture and watches as the photographer takes pictures of the newlyweds before a backdrop of stained-glass windows depicting the rise and fall of the Confederacy and a gallery of saintly-looking generals. Her day continues with a guided afternoon visit to the Margaret Mitchell House arranged for some of the non-Atlantan guests by the wedding planner. The guide ends his narrative of Mitchell's biography with informing his audience how she was killed by a speeding car on Peachtree Street in 1949. She was on her way to the cinema to watch *A Canterbury Tale*, a British wartime movie loosely linked with Geoffrey Chaucer's late fourteenth-century *Canterbury Tales*. Inspired by the story of Mitchell's life, our visitor ends

her day by renting David O. Selznick's film version of Mitchell's *Gone with the Wind* in her hotel room. She drifts off to sleep shortly after taking in the famous introductory foreword: "There was a land of Cavaliers and Cotton Fields called the Old South. Here in this pretty world, Gallantry took its last bow. Here was the last ever to be seen of Knights and their Ladies Fair, of Master and of Slave. Look for it only in books, for it is no more than a dream remembered, a Civilization gone with the wind...."

When I share this obviously fictional narrative with my students, they quickly catch on and research and identify dozens of other examples of how individuals, groups, corporations, and nations have recreated, reenacted, and reinvented the medieval past to make statements in their own postmedieval art, architecture, entertainment, literature, politics, race, religion, and sports. They soon notice that, while practically all these older forms of "medievalism" employ some kind of technology and scientific practice to represent what we know about the "real" Middle Ages, there now also seems to exist a new and different kind of connecting with medieval culture, one related to the ways in which various new media allow for heretofore unknown representations of space, story, and time.

More often than not, such recent narratives, with which my students tend to be more familiar than I, no longer make any serious attempt at heeding what scholars have established about the "real" Middle Ages. In fact, neomedievalist stories (*A Knight's Tale*; *Arcanum*; *Guild*; *Skyrim*; *Medieval*; *Total War*; *World of Warcraft*) are content with creating pseudo-medieval worlds that playfully obliterate history, authenticity, and historical accuracy and replace history-based narratives with "simulacra" of the medieval, employing images and narrating stories that are neither an original nor the faithful copy of an original, but entirely "Neo." Does this mean that these new simulational media will fundamentally change how we speak about and relate to the past, without a clear sense of origins and originality, "likeness" and verisimilitude? Will we no longer, as first Renaissance humanists and later Enlightenment thinkers have admonished us, try to become ever more perfect as human beings by studying the original stories, language, and motivations of our predecessors? And will this shift in our relationship to humanity's past contribute to the "posthuman" or "transhuman" kind of world science fiction writers and futurologists have been contemplating?

I am convinced that our students, with their strongly interdisciplinary curricular focus, are particularly well prepared to investigate "medievalist" as well as "neomedievalist" narratives, and Atlanta, Georgia Tech, and particularly LMC provide the perfect intellectual lab spaces to do that. As "critical makers" who write and interpret, build and critique, play and create, they are able to shape the future developments at the intersection of ever so many humanistic, sociological, and technological practices. In their multimodal lives and careers, past, present, and "Neo" will be of equal importance.