



GVU Center

Research Showcase

Technology Square Research Building

10. 26. 2016

TSRB 2nd Floor



- 222** Sonification Lab
- 235** Ubiquitous Computing Group
- 225** Design & Intelligence Lab
- 228B** Entertainment Intelligence Lab

- 233** Augmented Environments Lab
- 243** Contextual Computing Group
- 209** Design and Social Interaction Studio

- ★ Registration
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TSRB 3rd Floor



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ADAM Lab



The Adaptive Media Lab explores how to create digital media experiences that tailor themselves to individual users. These adaptations may occur for dramatic purposes (e.g. interactive narrative), educational purposes (e.g. serious games), and / or purely for entertainment. This research involves work in design, artificial intelligence, and human computer interaction.

Website: <http://adam.cc.gatech.edu>

Director: Brian Magerko

Faculty: Mark Riedl, Jason Freeman

Drawing Apprentice: Co-Creative Drawing Partner

Room 325

Collaboration is known to push creative boundaries and help individuals sustain creative engagement, explore a more diverse conceptual space, and synthesize new ideas. While the benefits of human collaboration may seem obvious, the cognitive mechanism and processes involved in open-ended improvisational collaboration are active areas of research. Our research group has developed a co-creative drawing partner called the Drawing Apprentice to investigate creative collaboration in the domain of abstract drawing. The Drawing Apprentice draws with users in real time by analyzing their input lines and responding with lines of its own. With this prototype, we study the interaction dynamics of artistic collaboration and explore how a co-creative agent might be designed to effectively collaborate with both novices and expert artists. The prototype serves as a technical probe to investigate new human-computer interaction concepts in this new domain of human-computer collaboration, such as methods of feedback to facilitate learning and coordination (for both the user and system), turn taking patterns, and the role control and ambiguity plays in effective collaboration.

Research Focus Areas: Artificial Intelligence, Cognitive Science

LuminAI: An Exploration of Human-AI Movement Improvisation

Room 325

LuminAI is an interactive art installation that explores the improvisation of proto-narrative movement between humans and virtual AI agents using full body, expressive, movement-based interaction. Interactors can co-create movement with an autonomous virtual agent that learns movement, response, and improvisation directly from interacting with human teachers. It analyses their movement using Viewpoints movement theory.

Research Focus Areas: Artificial Intelligence, Cognitive Science, New Media

Space Table: The life of a star

Room 325

The Space Table is an interactive informal experience to teach children about the formation of solar systems and how gravity, and mass play a role in their creation. Additionally, the project will explore the concepts of different celestial bodies such as stars, planets, asteroids, neutron stars, black holes and others. The installation will make use of three tangibles, one for a different star size. Interactors will use the tangibles to “stamp” a star on the table, which will spawn a digital star. After the star is created, interactors will be able to create asteroids and other space debris by sliding their fingers on the screen, which will in turn create bigger objects (such as moons or planets) when they collide with other small celestial bodies. Once the system is created, the expectation is for interactors to experiment with the celestial bodies, leading them to the discovery of cosmological concepts.

Research Focus Areas: Educational Technologies

Augmented Environments Lab



Lab activities focus on understanding how to build interactive computing environments that directly augment a user's senses with computer-generated material. Researchers are interested in augmenting the user's perception, and place particular emphasis on the interaction between the users and their environment.

Website: <http://ael.gatech.edu/lab/>

Faculty: Blair MacIntyre, Jay Bolter

Argon: AR-Enabled Web Browser

Room 233

Argon is a mobile web browser designed to bridge the gap between Augmented Reality and The Web. Following in the tradition of web browsers like Chrome and Firefox, which differentiate themselves by providing custom functionality that is not yet standardized across all browsers, Argon exposes the core technologies needed to make AR possible. By making computer vision tracking (via the Qualcomm's Vuforia library) available to web pages, Argon provides a browser-based platform for rapid development of fully-interactive 2D/3D AR content & applications. Come see projects & demos built using the Argon platform.

Research Focus Areas: Augmented Reality

Aware Home Research Initiative



Generally, people spend a good amount of time in their home performing everyday activities like: sleeping, eating, cooking, relaxing, entertaining, and so on; thus, it comes as no surprise that the home plays a key role in our health, lifestyle, and well-being. The Aware Home Research Initiative (AHRI) at Georgia Institute of Technology is an interdisciplinary research endeavor aimed at addressing the fundamental technical, design, and social challenges for people in a home setting. Central to this research is the Aware Home, a 3-story, 5040 square foot facility designed to facilitate research, while providing an authentic home environment.

Website: <http://awarehome.gatech.edu>

Director: Brian D. Jones

Connected Living Research Initiative

Room

Connected living is the fast-growing intersection of mobile, wearable, home, community, car and other technologies to assist individuals in accomplishing more seamless interactions and goals in daily life. Mobility and cloud computing are two pillars of growth that has brought about significant changes in industry. Cloud computing, big data, mobility and low-cost sensors are driving the internet of things and connected industries, and the internet of things is forcing transformation and innovation across the connected home, connected workplace and connected city. It is estimated that the Connected Living market will reach 730 Billion USD by 2020. We are in the process of defining the Connected Living Research Initiative (CLRI) to bring together industry stakeholders, academic/research faculty and civic partners in defining the future of the connected

life. CLRI is currently onboarding partners to delineate research goals that include (but is not limited to) the future impact of big data, improved user experience in daily activities, and data security and privacy in this ever more connected daily experience. For more information contact: Brian Jones or Siva Jayaraman

Research Focus Areas: Human-Computer Interaction, Mobile and Ubiquitous Computing, Wearable Computing

Cue - Connecting U Everyday

Room

No matter what age we are, we have likely forgotten to turn off the stove or oven, iron, heater or even water. Forgetfulness can lead to serious events that may result in costly damage to the home or even injury or death. Older adults are more prone to such forgetfulness. When an older adult forgets to turn off a hazardous appliance, it is often attributed to losing mental capacity and may lead to loss of self-confidence, embarrassment, and judgment from others. Many families turn to monitoring when they discover such hazards, but this can result in their loved one feeling a loss of independence. We feel there is an opportunity before monitoring to use technology to provide gentle reminders or cues that empower the resident to determine for themselves when such appliances should be turned off. Introducing cue. The system would consist of several ambient and/or wearable reminder products that would integrate with existing connected home systems and provide those gentle reminders both at and away from the primary hazard. We have designed, a couple of example reminder concepts, mainly for the stove, oven, iron, or heater to address this need. The latest consists of a device in proximity of the stove that provides a larger/brighter light than most stovetops with an integrated proximity sensing capability and a smartwatch with ability to vibrate and alert through sound and visuals. If motion is no longer detected in the kitchen, the watch would alert the user of the potential hazard. The user may also choose to snooze the reminder. While we focused on hazardous appliances, this same system may support cues related to medication taking, water leaks, door lock status, smoke detector battery level, feeding or walking the dog, or similar needs.

Research Focus Areas: Health Informatics, Mobile and Ubiquitous Computing

RERC TechSage: A Mobile Application to Measure Gait Speed

Room

Multiple studies have shown a consistently strong association between gait speed of frail older adults and negative functional (e.g., survival) and activity outcomes. However, health care professionals have been slow to measure this physiologic parameter, largely due to the lack of a simple, standardized way of measuring it. The purpose of this project is to develop a reliable, simple, and cost-effective mobile app to measure gait speed and demonstrate the feasibility of this measure as a predictive tool to identify risk of functional decline and activity limitation in frail elders who are aging with ambulatory disability.

Research Focus Areas: Health Informatics, Mobile and Ubiquitous Computing

RERC TechSage: SmartBathroom

Room

The needs and abilities of people who are aging with progressive chronic conditions, such as MS, Parkinson's, ALS and Arthritis fluctuate from day to day. Yet, even when they have supportive AT, such as grab bars, to compensate for functional limitations, those features are fixed, only able to support some abilities, some of the time. The purpose of this project is to develop a SmartBathroom environment capable of assessing an individual's abilities at any point in time and spontaneously adjusting supportive environmental features to accommodate those abilities.

Research Focus Areas: Mobile and Ubiquitous Computing

BrainLab



The Brain Lab explores innovative ways of accomplishing human-computer interaction through biometric inputs. Biometric interfaces identify and measure small changes in a person's behavior or physiological responses to certain stimuli. The work has potential in many areas, especially for providing individuals with disabilities a means of personal "hands-off" control of computers and other devices.

Website: <http://brainlab.gatech.edu>

Faculty: Melody Jackson

SMILE (Systems Using the Mind for Latent Expression)

Room 243

SMILE (Systems using the Mind for Latent Expression) is developing BCI-controlled wearable technology for expressing emotion

Research Focus Areas: Human-Computer Interaction, Mobile and Ubiquitous Computing, Wearable Computing



Comp.Social Lab

The comp.social lab focuses on the design and analysis of social media. According to their website they "like puppies, mixed methods and new students (particularly MS)."

Website: <http://comp.social.gatech.edu>

Director: Eric Gilbert

Analyzing blocking mechanisms on social media

Room 339

In this project, we analyze blocking mechanisms on social media. We perform a comparative analysis of different technically and socially curated block-lists on Twitter. We also conduct interviews with users who are on such block-lists as well as those who subscribe to them. Our analysis reveals nuances of online harassment and the tactics used by harassers. We discuss the limitations of state of the art moderation used by social media platforms like Facebook, Twitter, etc. We examine how the harassment victims appropriate the online tools and resources available to them to cope with online abuse. We also suggest design implications for improved blocking mechanisms.

Research Focus Areas: Online Communities, Social Computing

CREDBANK: A Large-scale Social Media Corpus With Associated Credibility Annotations

Room 339

Social media has quickly risen to prominence as a news source, yet lingering doubts remain about its ability to spread rumor and misinformation. Systematically studying this phenomenon, however, has been difficult due to the need to collect large-scale, unbiased data along with in-situ judgements of its accuracy. In this paper we present CREDBANK, a corpus designed to bridge this gap by systematically combining machine and human computation. Specifically, CREDBANK is a corpus of tweets, topics, events and associated human credibility judgements. It is based on the real-time tracking of more than 1

billion streaming tweets over a period of more than three months, computational summarizations of those tweets, and intelligent routings of the tweet streams to human annotators—within a few hours of those events unfolding on Twitter. In total CREDBANK comprises more than 60 million tweets grouped into 1049 real-world events, each annotated by 30 human annotators. As an example, with CREDBANK one can quickly calculate that roughly 24% of the events in the global tweet stream are not perceived as credible. We have made CREDBANK publicly available, and hope it will enable new research questions related to online information credibility in fields such as social science, data mining and health.

Research Focus Areas: Human-Computer Interaction, Social Computing

Identifying Human Trafficking Online

Room 339

We are looking at identifying instances of Human Trafficking on online marketplaces and review sites. Using textual and visual cues, we are training a classifier to predict likelihood of being trafficked.

Research Focus Areas: Social Computing

Real Time Aggregation of Keywords from Censored Posts on Sina Weibo using Hadoop and Cron

Room 333

With the increasing presence of censorship on Chinese social media, it is imperative to provide the users of platforms such as Sina Weibo a way to freely share information without alerting the censors and systems of surveillance on social media. The aim of this project is to implement a Real-Time Keyword Aggregator that collects keywords that have most likely resulted in censorship of posts from various publicly available archives of censored sina weibo posts. In this work, utilize a Distributed Computing based technique to identify additional possible keywords from the posts using a TF-IDF based technique. The result of this project will be a large, continuously populated and curated homophone dictionary for currently censored keywords on Sina Weibo.

Research Focus Areas: Social Computing

The Bag of Communities Approach: Identifying Abusive Behavior Online with Preexisting Internet Data

Room 339

Since its earliest days, harassment and abuse have plagued the Internet. Recent research has focused on in-domain methods to detect abusive content and faces several challenges, most notably the need to obtain large training corpora. In this paper, we introduce a novel computational approach to address this problem called Bag of Communities (BoC)—a technique that leverages large-scale, preexisting data from other Internet communities. We then apply BoC toward identifying abusive behavior within a major Internet community. Specifically, we compute a post's similarity to 9 other communities from 4chan, Reddit, Voat and MetaFilter. We show that a BoC model can be used on communities "off the shelf" with roughly 75% accuracy—no training examples are needed from the target community. A dynamic BoC model achieves 91.18% accuracy after seeing 100,000 human-moderated posts, and uniformly outperforms in-domain methods. Using this conceptual and empirical work, we argue that the BoC approach may allow communities to deal with a range of common problems, like abusive behavior, faster and with fewer engineering resources.

Research Focus Areas: Online Communities, Social Computing

Contextual Computing Group



The Contextual Computing Group focuses on projects to develop applications and interfaces for the computer to be aware of what the user is doing and to assist the user as appropriate. Several current projects at the research stage are envisioned to work together to assist a user in routine tasks such as automatically scheduling an appointment, re-directing an urgent phone call appropriately based on the user's schedule and current activity, and recognizing that the user is engaged in conversation and would prefer to take the phone call later.

Website: <https://research.cc.gatech.edu/ccg/>

Director: Thad Starner

CopyCat

Room 243

This project involves the design and evaluation of an interactive computer game that allows deaf children to practice their American Sign Language skills. The game includes an automatic sign language recognition component utilizing computer vision and wireless accelerometers. The project is a collaboration with Dr. Harley Hamilton at the Atlanta Area School for the Deaf.

Research Focus Areas: Educational Technologies



Contextualized Support for Learning

<http://home.cc.gatech.edu/csl/uploads/1/eup.png>

Website: <http://home.cc.gatech.edu/csl>

Director: Mark Guzdial

CSLearning4U: Creating Electronic Books for Teacher CS Learning

Room Outside Mark Guzdial's office

A key idea in CSLearning4U is that we can design CS learning opportunities. Simply wrestling an interpreter or compiler can't be the best way to learn about computer science. Throwing people into the deep end of the pool can teach people to swim, but there are better ways. We want to do better than a book for CS learning, and we want to design the phonics of computing education to integrate with the "whole language learning" of programming. We are creating a new distance-learning medium for computing education especially for in-service high school teachers based on ideas from instructional design and educational psychology. In-service high school teachers are particularly time-constrained (and thus need efficiency) and they are more metacognitively aware than other students (and thus able to better inform the project design). The new medium will combine multiple modalities, worked examples, and structure based on cognitive models of designers' knowledge. The research questions are that (1) the teachers will learn CS knowledge in the on-line setting, (2) the teachers will be more efficient at programming tasks, and (3) the teachers will find the materials useful and satisfying. Because of its focus on teachers, the project can potentially have broad impact, in particular on the strategies for training the 10,000 teachers envisioned in the CS 10K Project. The project will establish models and design guidelines that can be used for the creation of other learning materials, including materials for students in, for example, the proposed new CS Principles AP course.

Research Focus Areas: Educational Technologies, Human-Computer Interaction, New Media

Design & Intelligence Laboratory



The Design & Intelligence Laboratory conducts research into human-centered artificial intelligence and computational cognitive science, with a focus on computational creativity. Current projects explore analogical reasoning in biologically inspired design, visual reasoning on intelligence tests, meta-reasoning in game-playing software agents, and learning about ecological and biological systems in science education.

Website: <http://dilab.gatech.edu/>

Director: Ashok Goel

Faculty: Ashok Goel, Keith McGreggor, Spencer Rugaber

Intelligent agents, visual perception and cognition

Room Design and Intelligence Lab

Research Focus Areas: Cognitive Science, Perception, Robotics

Intelligent Biologically Inspired Design

Room

Research Focus Areas: Artificial Intelligence

Multifunctionality In Biologically Inspired Design

Room 229

Biological systems in general are multifunctional and environmentally sustainable. Thus, biologically inspired design is posited as leading to multifunctional and environmentally sustainable designs. Design in general is characterized as a problem-driven process. However, biologically inspired design also entails the twin process of solution-based design. Previous work has postulated that the solution-based design process is prone to design fixation but leads to more multifunctional designs. Design Study Library (DSL) is a digital library of eighty-three cases of biologically inspired design. We present a preliminary analysis of the DSL case studies to examine two hypotheses. (1) The process of solution-based design results in more multifunctional designs than the problem-driven design process. (2) The process of solution-based design is more prone to fixation than the problem-driven design process. We find strong evidence in favor of the first hypothesis.

Research Focus Areas: Artificial Intelligence, Cognitive Science, Educational Technologies

Design and Social Interaction Studio

DESIGN & SOCIAL
INTERACTION STUDIO

Design and Social Interaction Studio brings an interdisciplinary group of faculty and students together to examine the experiential and participatory dimensions of digital media and their relationship to establishing and supporting democratic forms of social interaction. Research at the studio spans both theoretical inquiry and experimental design, situated at the intersection of Design, the Humanities, and Human Computer Interaction. We design and investigate a variety of design products and services (e.g., locative media, visualizations and mapping, policy media, social and educational media) drawing on a range of design methods and strategies, most notably participatory and co-design methods, ethnographic methods, and experimental designs. Projects are often in collaboration with other units on campus, other schools, as well as local non-profit organizations. Among current collaborators are Schools of Public Policy and Electrical Engineering at Georgia Tech; the iSchool at the University of British Columbia; Mayo Clinic; and local organizations such as Marcus Autism Center, Children's Healthcare of Atlanta, Fulton County Department of Health, and Central Atlanta Progress.

Website: <http://designstudio.gatech.edu>

Director: Nassim JafariNaimi

(T)racing Eyes and Hearts: An Installation to Explore the Physiology of Empathy

Room 209

Eyes darting, or maintaining a steady gaze straight ahead. Heartbeat racing, or maintaining a slow, even rhythm. If we encounter these phenomena in another, how do we respond – not just affectively, but physiologically? Eye movements and heartbeats are among the most intuitively meaningful physiological characteristics that humans observe in one another. Without necessarily consciously realizing it, we often respond empathetically. This project brings together humanities scholars and physiology scholars to create an art installation that uses representation, tracking, and visualization to investigate and reflect upon the physiology of empathy. The installation renders video of eye movements and audio of heartrate of a virtual person, and tracks the eye movements and heartrate of an observing user. We anticipate a mirroring, empathetic physiological response from the user, in which their heartrate also speeds and slows in conjunction with the virtual person. Immediately after the experience, the user will be provided a visual and auditory representation of the data, in order to see and reflect on this empathetic engagement, and also provided with a link to a copy of the video by email if they so choose. The playback could be either in real time, or in a time that is set to either the virtual person or the user's heartrate as a metronome, to allow a distinctively human-centered exploration of the data.

Research Focus Areas: Human-Computer Interaction, Information Visualization, Perception

Our Driverless Futures: Through the Lens of Speculative Moral Algorithms

Room 209

Autonomous vehicles, more popularly known as self-driving cars, have recently entered public imagination as the next frontier in safer and more efficient transportation. With heavy investments from tech companies such as Google, Tesla, and Uber, self-driving cars seem to be inevitable. Yet, the technology is far from perfect. Among unresolved issues are ethical questions of how cars might/must react in situations of an unavoidable accident. Should the car protect its passengers at all costs? Or should it sacrifice the life of one to benefit a few? Proponents argue that these questions will be eventually addressed through the design of "moral algorithms", or algorithms that are designed to make ethical decisions. In this project, my goal is to combine speculative design and design research approaches to portray potential scenarios for driverless cars, with artifacts that simulate a driverless future. These artifacts serve two purposes: first, to be presented to potential users with the intent of generating feedback on the implications of moral algorithms; second, to elicit discussion on the role of algorithms and institutions in managing our lives and their 'solutionist' strategies for civic problems. Finally, the design of these artifacts will be informed by a literature review of the social properties of algorithms. By combining both

speculative design and design research approaches to imagine probable future scenarios, my aim is to further broaden the terms of discourse around moral technologies, their inherent limitations, and palpable consequences. The demo will include my initial sketches and early prototypes in this direction.

Research Focus Areas: Human-Computer Interaction, New Media

Sweet Auburn Digital Media Initiative

Room 209

Can locative media (Augmented and Mixed Reality, web applications, and social networking) serve as a platform for preservation of cultural heritage, informal education, and civic engagement? This is the question at the heart of the Auburn Avenue Research Project, a project that brings together researchers from variety of disciplines – including media theory, design studies, and human-computer interaction – to engage the above question in theory and practice. Through the creation of a tiered media strategy, the Auburn Avenue Research Project takes advantage of real world development project (e.g., new physical signage, street car) and potentials of digital technology to raise awareness of Auburn Avenue’s history an future trajectory, to increase the number of visitors to the neighborhood, and to support community preservation and revitalization efforts. Project objectives include: To explore the usage of locative media forms for their potential to increase civic engagement among visitors and residents. To make the rich cultural heritage and history of Auburn accessible to people by integrating new and old representational media.

Research Focus Areas: Augmented Reality, Civic Computing, Information Visualization

Digital World and Image Group



The Digital World and Image Group focuses on two main areas: virtual spaces and real-time imagery gathered from them. We see game spaces and game media as important forms of self-expression. That is why we work to improve creative access and the expressive range available in interactive digital media such as games. Research is conducted in a combination of theory, analysis, and practical experimentation.

Website: <http://dwiG.lmc.gatech.edu>

Faculty: Michael Nitsche

Prototyping Puppets - Teaching Circuitry

Room 325

We combine craft and performance art to teach early middle school students basic prototyping skills. We develop informal STEM workshops for puppetry that combine narrative framing, craft-inspired building, and performance. This key approach combines craft, art, and basic hardware prototyping to attract new audiences to STEM. It is a collaboration between Georgia Tech and at the Center for Puppetry Arts funded by the NSF.

Research Focus Areas: Educational Technologies

Using AR in Comic Art: Attention as a Commodity

Room 325

How can we use AR in combination with Comic Artwork to shift attention from the page to the screen and back? The project combines HCI with the ninth art: comics. It applies design criteria from comic scholars and practitioners such as Will Eisner and Scott McCloud to develop effective AR designs for hybrid comic pieces. We will present a prototype sample of this project at work.

Electronic Learning Communities



The concept that people learn best when they are making something personally meaningful - also known as constructionism - is the lab's guiding philosophy. Computer networks have the potential to facilitate community-supported constructionist learning. The Electronic Learning Communities Lab examines ways communities of learners can motivate and support one another's learning experiences.

Website: <http://www.cc.gatech.edu/elc/index.shtml>

Faculty: Amy Bruckman

The Internet in Cuba

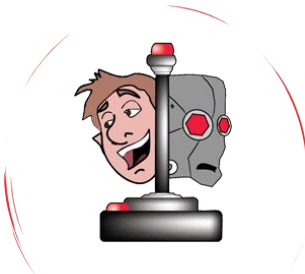
Room Social Computing Labs - 338

With nearly four billion people still lacking access to the internet, efforts to expand internet access are growing rapidly across the world. Cuba remains one of few emerging nations where this access is still affected by historical trade embargoes and restrictions. Since the 2014 announcement of the normalization of relations between Cuba and the U.S., however, internet access in Cuba is increasing. This work is situated during this time of transition to explore the impacts of increasing internet access on individuals and communities living in Havana. "The internet" in Cuba is currently made up of four separate components: slow access at places of work, content sold on USB thumb drives ("El Paquete"), an intranet custom designed by citizens ("StreetNet"), and public wifi hotspots available at exorbitant prices (opened in March 2015).

In this work, we seek to understand the particularity of each of these parts, and the bigger whole that emerges during this time of transition. The Cuban context provides for a compelling study on how on how a highly literate population with a history of state-controlled information, and thriving offline practices transitions to deriving meaning out of an online, global, networked infrastructure. Through ethnographic, qualitative research methods, this project aims to develop a ground-up, holistic understanding of the information infrastructures that have evolved in Cuba as a response to individual values and ongoing constraints. These findings will inform the design of technologies that are context-appropriate but also flexible enough for users to modify and appropriate them in meaningful ways.

Research Focus Areas: International Development, Online Communities, Social Computing

Entertainment Intelligence Lab



The Entertainment Intelligence Lab focuses on computational approaches to creating engaging and entertaining experiences. Some of the problem domains they work on include, computer games, storytelling, interactive digital worlds, adaptive media and procedural content generation. They expressly focus on computationally "hard" problems that require automation, just-in-time generation, and scalability of personalized experiences.

Website: <https://research.cc.gatech.edu/eilab/>

Faculty: Mark Riedl

Automatically Generating Game Levels from Gameplay Videos

Room 228

Check out videos of the system: [here](#) and [here](#) Intelligent tools can ease the burden of game development. One approach to easing this burden is the use of co-creative, artificial agents, capable of helping a human developer by making suggestions or extending an initial design. However, agents capable of design have historically required a large amount of hand-authored design information—domain-specific rules, heuristic functions, or formal logic rules. Due to the time it takes to author this knowledge, such approaches do not remove the development burden, but shift it to the author of the agent. To solve this problem we present a demonstration of a level-authoring tool with a co-creative agent informed by knowledge learned from gameplay videos. The technique is demonstrated in the popular game, Super Mario Bros. We offer the experience of co-designing a level with a co-creative agent and then playing through the level yourself or with a friend.

Research Focus Areas: Artificial Intelligence, Gaming

Procedurally Generated Augmented Reality Games

Room

Augmented Reality gaming promises new ways for humans to engage with their physical environment by overlaying gameplay elements via a head-mounted display. We present an artificial intelligence technique to automatically generate novel gameplay content for mixed-reality environments. We demonstrate the technique with a game we call "Augmented Reality Lemmings", a platform game in which the level content was procedurally generated.

Research Focus Areas: Artificial Intelligence, Gaming

Everyday Computing Lab



We introduce a new area of interaction research, everyday computing, by focusing on scaling ubiquitous computing with respect to time. Our motivations for everyday computing stem from wanting to support the informal and unstructured activities typical of much of our everyday lives. Our goal is understanding the transformation of everyday life as computing is ubiquitously integrated into informal, daily activities and routines.

Website: <https://research.cc.gatech.edu/ecl/>

Director: Beth Mynatt

Defining Digital Self Harm

Room 342

This project aims to define the concept of digital self-harm for the HCI community. In this project we have explored the limited HCI scholarship related to self-harm within a social computing context. We offer the community an operationalized definition of digital self-harm and propose a theoretical base to orientate related research questions into actionable activities. We also describe a research agenda for digital self-harm, highlighting how the HCI community can contribute to the understanding and designing of technologies for self-harm prevention, mitigation, and treatment.

Research Focus Areas: Social Computing

Designing Adaptive Technology to Provide Personalized Support to Cancer Patients

Room 342

We design, deploy, and evaluate mobile health tools that support and meet patients needs over time from diagnosis of a chronic disease, through treatment and into survivorship. Our research explores the ability for personalized, adaptable, mobile tools to support patients over the course of their individual breast cancer journeys. Our technology needs to anticipate and recognize barriers to care that occur at various points in a cancer journey, adapt with the patient as they navigate these barriers, and successfully provide patients with the tools and resources they need to manage and mitigate such barriers. The goal of our work is to improve patient health outcomes by supporting patients' outside of the clinic by helping them to learn about, engage with, and manage their disease alongside the demands of daily life.

Research Focus Areas: Health Informatics, Human-Computer Interaction, Mobile and Ubiquitous Computing

Epilepsy - Health dashboard for remote patient outreach

Room 342

Health dashboards stand to help clinicians to identify patient challenges and contact patients between appointments. Many patients and caregivers struggle to complete epilepsy self-management practices: remembering to take daily medications, reporting seizure events and self-regulating behaviors such as getting enough sleep. Jon Bidwell and Beth Mynatt are working with attendings at the Children's Healthcare of Atlanta (CHOA) to develop a health dashboard for clinicians. The proposed health dashboard aims to help nurse practitioners review patient and caregiver collected health data, evaluate how well patients and families are keeping up with daily self-management practices and prioritize phone call follow-ups. In the coming months, patients and families will be given a range of mobile and wearable health tracking technologies. These technologies include: a mobile phone app for reporting seizures and health information, a smartphone for detecting medication adherence, a wristband for measuring seizures and sleep at night and a a wristband for measuring daily activities and stress throughout the day Healthcare professionals are using technologies to stay increasingly connected with patients and caregivers between appointments. This research seeks to help a small number of clinicians to reach a much larger group of patients.

Research Focus Areas: Health Informatics, Human-Computer Interaction

User Centered Design of a Patient Monitoring Dashboard

Room 342

Patient care happens in homes as well as away from them. Care providers spend a significant amount of time in trying to piece these different pieces together and come upto speed with the patient's current status. This user centered design of dashboard will provide them with a means for patient monitoring and help them get all the information that they need in that moment at a glance. At this time, this project focuses on achieving its goals in the context of Breast Cancer, specifically for Cancer Navigators.

Research Focus Areas: Collaborative Work, Human-Computer Interaction

Experimental Television Lab



Georgia Tech's ETV Lab explores the future of narrative forms in the new digital medium that is emerging as TV converges with computational formats. The lab prototypes applications on current and hypothetical platforms, using narrative material drawn from actual and planned television shows and by creating its own narratives specifically designed for interactivity. Drawing on students in the Georgia Tech's graduate program in Digital Media, the group has prototyped interactive video applications for delivery on the internet, dvd, and consumer TV platforms.

Website: <http://etv.gatech.edu>

Faculty: Janet Murray

AquaRium Tour: Georgia Aquarium tour experience design

Room 322

This project integrates augmented reality to redesign the Georgia Aquarium tour experience. Based on the existing digital contents from Georgia Aquarium, AquaRium Tour features user-centered interaction to facilitate the aquarium tour experience, incorporating the functions of navigation, providing knowledge about aquatic life as well as sharing and other social features.

Research Focus Areas: Augmented Reality, Mobile and Ubiquitous Computing, New Media

ARES

Room 322

In a race against the clock, players embark on a dangerous adventure. Within moments, the journey goes haywire. Lost and alone, the player finds themselves stranded. In this VR interactive narrative, players fight to survive the dangerous landscape. Utilizing Oculus Rift, Unity, and unique interaction paradigms, Ares explores a wide range of new techniques in VR storytelling. This distinctive, immersive experience will test user's survival skills and offer an exciting challenge.

Research Focus Areas: Gaming, Human-Computer Interaction, Virtual Reality

Bridging Cultural Differences

Room 322

In the era of globalization, the ordinary viewer is exposed to cinematography from different countries and cultures, but does one understand the cultural context portrayed by the artists? In this project I intend to use interactive television as a medium, that helps the viewer to gain a deeper understanding of a movie, by exposing him/her to its cultural layers.

Research Focus Areas: Educational Technologies, Human-Computer Interaction, Mobile and Ubiquitous Computing

ClipLine

Room 322

ClipLine—A social sharing mobile platform that helps users turn their favorite TV scenes into customized GIFs and instantly share them with their friends and the outside world. Voting up the best GIFs, re-clipping, and following other accounts will also be main features of ClipLine.

Research Focus Areas: New Media, Online Communities, Social Computing

Escape Room VR

Room 322

Moving from 2D and digital to 3D and virtual, Escape Room VR explores the opportunities for computers to communicate with humans more effectively in the medium of virtual reality. This is a short demo that will ignite your curiosity of your surroundings and encourage the discovery of playful interactions. Real-time, 3D, and highly interactive, are you ready to escape the room?

Research Focus Areas: Human-Computer Interaction, Virtual Reality

StrangVR Things

Room 322

StrangVR Things is a VR prototype that crafts an immersive and engaging experience within the narrative world of Netflix's original series, Stranger Things. The user takes on the role of Eleven and must escape a hostile environment by leveraging her telekinetic powers. Our design aims to allow show viewers to explore the dangers of the Stranger Things world through Eleven's eyes and endow viewers with the same mysterious powers.

Research Focus Areas: Gaming, Perception, Virtual Reality

Health Experience and Applications Lab (Hx Lab)



We investigate how interactive technologies can be designed and developed to facilitate personal health-related information awareness and understanding. We study, design and develop computing tools for digital communication of health status and progress, drawing from the perspectives of clinical caregivers, families, and individuals.

Website: <http://www.hx.gatech.edu>

Director: Lauren Wilcox

Rapport: Pediatric Patient and Family Oriented Radiology Report

Room 345 / Next to the MS-HCI lounge

Diagnostic radiology reports are increasingly being made available to patients and their family members. However, these reports are not typically comprehensible to lay recipients, impeding effective communication about report findings. Rapport is a prototype system that aims to facilitate communication about radiology imaging findings among pediatric patients, their family members and clinicians in the clinical setting.

Research Focus Areas: Health Informatics, Human-Computer Interaction

MS-HCI Project Lab



Students in Georgia Tech's interdisciplinary MS in Human-Computer Interaction program do multiple group class projects, and a capstone individual project. Some projects are presented as part of other labs listed here; others are showcased in the MS-HCI Project Lab. The two-year program spans four schools: Industrial Design; Interactive Computing; Literature, Media and Communications (Digital Media Program); and Psychology. Approximately 50 new students enroll each fall semester.

Website: <http://mshci.gatech.edu/research/labs>

Faculty: Richard Henneman, Carrie Bruce

Medication Management Tool Design for Students

Room HCI lounge

A tool which provide bran-new medication management experience to students as well as consider international students special pain points when using the US. medication system.

Research Focus Areas: Health Informatics, Human-Computer Interaction

Privacy Engineering

Requirements Engineering for Privacy, Security and Compliance in Data Science Research Projects

Room 235

This research addresses the privacy, security, and compliance challenges faced by university researchers and ethics review boards when working on data science projects. Due to the emergent properties of big data, researchers regularly re-evaluate and modify their goals. These changes must be reflected in the project's governing documents, including research protocols, consent forms, privacy and security policies, and data-use agreements. These documents must be consistent, must cater to diverse and sometimes conflicting stakeholder needs, must be compliant in a complex regulatory landscape, and must ensure the privacy and security of research participants. Consistent involvement by a privacy and security expert in every research project, although effective, is not a feasible solution. The goal of this project is to explore whether requirements engineering can be leveraged as a potential solution to these challenges. Requirements engineering can not only help align stakeholder goals with a project's governing documents but can be used to develop tools to enable researchers and ethics review boards to better address privacy, security and compliance in research protocols.

Research Focus Areas: Requirements Engineering

Public Design Workshop



The Public Design Workshop is pedagogical structure created to explore new ways to teach, learn, and do social design within the university. We explore how design contributes to the construction of publics, articulates contemporary social and political issues, and fosters new forms of engagement with technology. We do this through participatory workshops & events, speculative design, and theory & criticism. We design events, workshops, objects, and systems. We also do theory and criticism. We are always open to new collaborators. Current topics of interest include: food and food systems, hackathons, infrastructure, visualizations, tools, and maps.

Website: <http://publicdesignworkshop.net>

The Object Ecology: designing edge cases for the Internet of Things

Room 317B

Usually, objects are considered to be discrete instantiations of something unique and unitary, comprising one individual thing and not another. Some technological developments are making that assumption murkier. Ubiquitous computing and mobile devices have begun to shift how objects operate. As examples, clothing is being instrumented with computational capabilities, creating the fields of “wearables.” Networked appliances in the home become members of “the Internet of Things.” From bit players in the world, electronics and computation have augmented everyday objects into viable actors in their own right, active participants in the world that sense, report, and scheme to their own ends. By revealing these multiple obligations in more explicit ways, computational communication underscores the idea that objects in the world have always been members of multiple networks, involving themselves in social arrangements both subtly and dramatically. This simultaneous involvement in various networks—information, electronic, legal, cultural, material, and more—is what I call Object Ecology. What this ecological understanding of objects reveals is that objects cannot and should not be treated discretely. Instead, they must be considered as component members of an assemblage of actants. One ecosystem of objects that resonates deeply for most people is the home. ‘Domesticity’ is comprised of all sorts of objects: plates, furniture, heating vents, entertainment systems, family members, rugs and much more. By providing computational capabilities to materials in the home, the Internet of Things has entered this domain—brashly, but also intriguingly. It proffers a greater control of their environment to residents of “smart homes,” but access to this kind of technology is asymmetrical. Many communities and styles of living are excluded from the usual residential understanding of the Internet of Things. These outliers—cohousing communities, tiny homes, combination live/work spaces, homes with multiple adult roommates, and so on—offer a vantage to both critique contemporary IoT practices and provide a provocative set of sites to do design work from an ecological perspective.

Research Focus Areas: Human-Computer Interaction, Mobile and Ubiquitous Computing, New Media

Social Dynamics and Wellbeing Lab

Director: Munmun De Choudhury

Examining behavioral markers leading to social media disclosures of psychosis

Room 341 A

Mental illness such as psychosis and schizophrenia are serious public health concerns. However, timely detection of an episode of psychosis is often difficult due to several reasons such as social stigma, lack of mental health awareness and literacy, and the retrospective nature of clinical therapy. We examine the potential of leveraging social media disclosures as a new kind of lens in characterizing and predicting experiences leading up to a psychotic episode. In contrast to self-report

methodology, where responses typically comprise of recollection of (subjective) health facts, social media captures behavior and language in a naturalistic setting. This gives us access to real-time activity and psychological states that can be analyzed to discover and predict behavioral markers associated with a psychotic episode. With an initial dataset of 11,000 tweets which disclose symptoms of psychosis such as hearing voices, having delusions, schizophrenia etc., we develop a computational method to identify behavioral and linguistic markers that attribute to an episode of psychosis. Further, in collaboration with clinical psychologists, we examine specific user timelines that include mentions of relapse or hospitalization. Based on the data analysis, we aim at building a prediction model to identify prospective behavioral markers leading to an episode. We believe information derived from our prediction model can be valuable to clinical psychiatrists in facilitating timely diagnosis.

Research Focus Areas: Social Computing

Online Support for Mental Health

Room 341A

Mental health issues are considered to be socially stigmatized in the society. Consequently, to many individuals, finding a trusted individual whom they can confide to regarding their mental illness is a grave challenge. It has been established that online communities provide a powerful platform of candid disclosures and support seeking around stigmatized concerns and experiences. Online health support groups in Reddit, in particular, due to their semi-anonymity feature, have established an extensive support platform for people with social inhibitions seeking help. These communities can provide support in various forms, ranging from informational to emotional support.. Informational support may be helpful for short term challenges in contrast to the emotional support. However, information support can also present itself with credibility and trust issues. On the other hand, emotional support is deemed more helpful to people suffering from mental illness. How do these different types of support impact an individual's perceived sense of mental well-being in an online community? How do support types relate to an online community's helpfulness, efficacy, and survival over time? Through this project, we will show some preliminary quantitative findings that addressed these questions.

Research Focus Areas: Social Computing

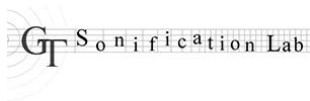
Using Facebook Ad Audience Estimates to Study Psychosis Awareness in the US

Room 341A

The objective of the study was to explore how the awareness of psychotic disorders varies with different demographics, like gender, age, education and ethnic affinity on social media across each of the states of United States. The facebook ad audience api, which returns an estimate of reach, when queried with demographic parameters like gender, age, education level, region, ethnic affinity and target interest was used in this study. The target interest in our study was Psychosis and psychotic disorders like Schizoaffective Disorder, Hallucination, Schizophrenia Awareness and Paranoid Schizophrenia. The api-returned statistic was roughly validated against the Pew tally of adult facebook users in United States. In addition, we used Government's Mental Health Services Administration data for the count of state-wise mental health institutions, Census data for population and Human Development Index data. We did descriptive statistical analysis on the data, computed correlation metrics and fit regression models for the psychosis-related interest counts with the above parameters. The variation and quantitative association of awareness of psychotic disorders on facebook, with different demographic parameters was an interesting outcome of the study.

Research Focus Areas: Social Computing

Sonification Lab



The Georgia Tech Sonification Lab is an interdisciplinary research group based in the School of Psychology and the School of Interactive Computing at Georgia Tech. Under the direction of Prof. Bruce Walker, the Sonification Lab focuses on the development and evaluation of auditory and multimodal interfaces, and the cognitive, psychophysical and practical aspects of auditory displays, paying particular attention to sonification. Special consideration is paid to Human Factors in the display of information in "complex task environments," such as the human-computer interfaces in cockpits, nuclear powerplants, in-vehicle infotainment displays, and in the space program. [Random Image of Auditory Interface] Since we specialize in multimodal and auditory interfaces, we often work with people who cannot look at, or cannot see, traditional visual displays. This means we work on a lot of assistive technologies, especially for people with vision impairments. We study ways to enhance wayfinding and mobility, math and science education, entertainment, art, music, and participation in informal learning environments like zoos and aquariums. The Lab includes students and researchers from all backgrounds, including psychology, computing, HCI, music, engineering, and architecture. Our research projects are collaborative efforts, often including empirical (lab) studies, software and hardware development, field studies, usability investigations, and focus group studies.

Website: <http://sonify.psych.gatech.edu>

Faculty: Bruce N. Walker

Advanced Auditory Menus

Room 222

Many electronic devices, from desktop computers to mobile phones to DVD players, can be thought of as a menu of functions. These functions can be accessible to a blind user if the menus are spoken aloud. However, this is extremely inefficient, so we have been enhancing auditory menus with sophisticated text-to-speech, spearcons, spindex, and other audio extensions. These can also be applied in many different languages and research is ongoing to look at more language applications, including tonal types.

Research Focus Areas: Human-Computer Interaction, Information Visualization, Mobile and Ubiquitous Computing

Air Gesture-Based Systems for Accessible Stem Education

Room 222

This project is exploring ways of using air gesture technologies, audio and haptic to facilitate exploration of STEM concepts by blind and low vision learners. Efforts will establish the efficacy of this approach, as well as best practices for creating air gesture interfaces that support exploration of a virtual reality space such as a simulated atom, wind tunnel or electrical system- all without the use of vision.

Research Focus Areas: Educational Technologies, Human-Computer Interaction

Audio Lemonade Stand Game

Room 222

This project helps teach STEM concepts with an audio-enabled version of the Lemonade Stand Game, in which visually impaired players (or any player that wants to experience a game that is sound dependent) need to manage their own stand while factoring in weather, local events, advertisement, and pricing in order to maximize profit for their business.

Research Focus Areas: Educational Technologies, Gaming, Human-Computer Interaction

Auditory STEM: Math and Science Education for Students with Vision Impairment

Room 222

The graphs and figures that are so prevalent in math and science education make those topics largely inaccessible to blind students. We are working on auditory graphs that can represent equations and data to those who cannot see a visual graph. A number of new areas we're starting research on is looking at teaching astronomy concepts through (like the Solar System) and the teaching and understanding of weather information through a combination of sonification and auditory description. Additionally we are working on making statistical output accessible for blind users to assist with higher level mathematics applications. We have a whole ecosystem of software and hardware solutions, both desktop and mobile, to help in this space. This project is in collaboration with the Georgia Academy for the Blind and the Center for the Visually Impaired of Atlanta.

Research Focus Areas: Educational Technologies, Human-Computer Interaction, Information Visualization

Automated Driving Displays

Room 222

Automated safety systems, a first step toward autonomous vehicles, are already available in many commercial vehicles. These are systems such as adaptive cruise control, which has the capability to slow down due to traffic, and automatic lane keeping, which maintains position within a lane without driver intervention. In order to ensure that these systems are properly used by drivers it is essential that they understand and appropriately trust the technology. We are currently investigating personal characteristics and driving environments that influence acceptance and use of automated safety systems and developing multimodal displays to increase situation awareness.

Research Focus Areas: Human-Computer Interaction, Information Visualization, Mobile and Ubiquitous Computing

Driving Georgia Tech: Creating a Driving Simulation of Georgia Tech's Campus

Room 222

Applying driving simulators for in-vehicle research allows for a wide range of studies to be performed particularly when investigating cognitive demand and distraction caused by devices in the car. By using simulations, researchers can investigate driving behaviors in high-risk situations without putting participants or others in harmful way. Currently being conducted within the School of Psychology at Georgia Tech, in-vehicle research could provide more insight into behavior and increase in applicability if participants were able to drive in areas that they are familiar with. Specifically, research being done in coordination with the Atlanta Shepherd Center investigating the use of in-vehicle technologies to assist individuals who have had a Traumatic Brain Injury could benefit largely through these real location maps. The Georgia Tech School of Architecture coincidentally has already developed a 3D model of the Georgia Tech campus and some of the surrounding areas including the Peachtree corridor (26 miles along Peachtree Street). However, in order to make this model usable within the simulator, it must be optimized and converted in a compatible format. Researchers in the School of Architecture and School of Psychology will be working on creating methods and conversion processes that will allow any 3D model to be integrated into the simulator. Development of this process of conversion will allow Georgia Tech to offer documentation and map-creation services to other researchers around the world assisting in increasing the applicability of in-vehicle research.

Research Focus Areas: Graphics and Animation, Virtual Reality

Enhanced In-Vehicle Technologies: Novel Interfaces and Advanced Auditory Cues to Decrease Driver Distraction

Room 222

In-vehicle technologies such as modern radios, GPS devices, eco-driving displays, and smartphones require users to interact with multiple types of visual-based menus and lists while driving. Modern technologies require users to navigate these screens using physical buttons and touch screens, although recent advances have included the use of steering wheel

buttons, turn wheels, Head Up Displays (HUDs) and others. Through design and prototyping of novel menu system interfaces through innovative visual display methods, interaction techniques, and the application of advanced auditory cues to old designs and these novel interfaces, we can attempt to decrease driver distraction, therefore allowing for better driving performance, while also improving search times and decreasing cognitive load on the driver.

Research Focus Areas: Human-Computer Interaction, Mobile and Ubiquitous Computing, Perception

Mwangaza Project

Room 222

The Mwangaza Project is a collaboration among the Sonification Lab, inAble, and Kenyatta University to develop and deploy accessible STEM educational resources to schools for the blind throughout Kenya. Projects that we are working on include accessible weather and climate education, math software for accessing graphing and number lines, and renewable energy as a component of STEM education and support for educational technologies.

Research Focus Areas: Educational Technologies

System for Wearable Audio Navigation (SWAN)

Room 309

The System for Wearable Audio Navigation (SWAN) serves as a navigation and orientation aid for persons temporarily or permanently visually impaired. SWAN is in the early stages of a software rewrite and technology upgrade. Interaction techniques are being prototyped in Virtual Reality (VR) to support preliminary user studies of new features.

Research Focus Areas: Human-Computer Interaction, Mobile and Ubiquitous Computing, Wearable Computing

Virtually spatialized audio over bone conduction to support auditory situation awareness and increase pedestrian safety

Room 222

Most sound comes through our ears. However, it is also possible to pass vibrations through the bones of the head, and bypass much of the normal hearing pathway. This is called bone conduction audio, and can be used in situations where the ears need to be plugged, or where you need to leave the ears open to hear ambient sounds. We are studying the psychoacoustics as well as the applied aspects of bone conduction audio. A current application being investigated is the scenario of the distracted cyclist or pedestrian. This research is aimed at determining additional ways of further improving awareness of ambient sounds, in addition to using bone conduction devices, through techniques such as virtual spatialization or audio filters. This research will improve the safety of the many pedestrians and cyclists who currently wear headphones while going about their daily lives.

Research Focus Areas: Mobile and Ubiquitous Computing, Perception, Wearable Computing



TanDEm

In the TanDEm lab, we focus on matters relating to the design, deployment, adoption, and use of technologies towards empowerment - of underserved and under-represented communities in resource-constrained regions across the world.

Faculty: Neha Kumar

Eating Right : Diets for Diabetes In India

Room

Research Focus Areas: Human-Computer Interaction, New Media

Goodbye Text, Hello Emoji

Room

This project is a qualitative study of non-textual mobile communication practices in Southern China. Examining the rapid proliferation of emoji in WeChat use, we attend to the lessening dependence on text. We use interview and observation data from 30 participants to investigate how rural, small town, and urban Chinese adults creatively and innovatively balance the use of emoji and text in their communication, as we envision the evolution of emoji into a modality of its own. We look into various possibilities for future work to explore circumventing the prerequisite of print literacy for mobile communication, especially for low-literate populations.

Research Focus Areas: Human-Computer Interaction, International Development, Social Computing

Healthcare Access in Marginalized Communities

Room

Despite repeated efforts by governments, historically, marginalized communities around the world have had limited access to quality healthcare due to the interplay of complex socioeconomic, political, and cultural factors. Our group studies the nature and extent of this 'limited access' to healthcare, to construct a nuanced understanding of this phenomenon. Our goal is to extend lessons from our research work to inform the design of not just healthcare interventions, but interventions in the larger field of information and communication technologies for development (ICTD).

Research Focus Areas: Human-Computer Interaction

ICTs for HIV outreach work in India

Room

Research Focus Areas: Collaborative Work, Human-Computer Interaction, International Development

Learning about Teaching in Low-Resource Environments

Room Social Computing Labs - 338

While there is a growing focus on leveraging technology use for learning gains across the world, this focus is yet to extend to infrastructurally limited environments in India, among other countries. We draw on qualitative research conducted in the Indian states of Tamil Nadu, Maharashtra, and West Bengal to highlight the challenges of designing educational technologies for "low-resource" contexts, particularly when they are "low-resource" along different dimensions. We also present findings from a survey of online educational technology providers in India to highlight the gaps that must be addressed before these can target socioeconomically disadvantaged populations. Taken together, our research provides a deeper understanding of the nuances that accompany "low-resource" and how a careful assessment of these might inform appropriate design of educational technology interventions in the field of HCI for Development (HCI4D).

Research Focus Areas: Educational Technologies, Human-Computer Interaction, International Development

Unpacking Informal Volunteerism: WhatsApp Use for Crisis Relief in Ecuador

Room

When Ecuador was hit by a 7.8 intensity earthquake on April 16, 2016, the coordination efforts that unfolded relied heavily on the use and appropriation of social media such as WhatsApp, Facebook, and Twitter. While studies on informal volunteers in crisis situations have largely examined digital volunteerism and visible online activities, behind-the-scenes interactions among informal volunteers on the ground remain understudied. We present a qualitative interview study of

how Ecuadorian informal volunteers self-organized to provide relief efforts in response to the earthquake. We found that informal groups of volunteers appropriated WhatsApp to articulate relief efforts within their groups and beyond. Drawing on our findings, we emphasize that the design of technologies for crisis response must consider how informal volunteers on the ground harness existing technology practices and situated expertise to address the ever-changing demands of the crisis relief environment.

Research Focus Areas: International Development, Mobile and Ubiquitous Computing, Social Computing

Virtual Reality for Learning

Room

Our research examines the role that low-cost virtual reality technology could play in supporting learning in low-resource contexts. Specifically, we propose to study the potential of creating affordable virtual reality-based learning experiences for children in these contexts. There has been a rising penetration of low-cost mobile technologies and internet connectivity in under-resourced communities, and this motivates us to explore the feasibility of virtual reality as a medium to enhance learning experiences for low-resource contexts. We use the Google Expeditions Kit, which is an example initiative that does not require a quality internet connection, runs on low-cost Cardboard VR viewers, and uses smartphones that are becoming widely prevalent in low-resource regions.

Research Focus Areas: Educational Technologies, Human-Computer Interaction, Virtual Reality

When the Internet Goes Down in Bangladesh

Room

We present a study of Internet use and its forced non-use in Bangladesh. In light of current initiatives on state and industry actors to improve Internet access and bridge the 'digital divide' for underserved, under-resourced, and under-represented communities across the world, we offer a situated, qualitative perspective on what the current state of Internet use looks like for select social groups in Bangladesh. We analyze how a state-imposed ban attempted to effect the non-use of particular web-based services and how the affected populations found or did not find workarounds in response. We also discuss takeaways for researchers as well as industry and state actors studying and working towards more equitable access to the Internet in the 'developing' world.

Research Focus Areas: Human-Computer Interaction

Women's Safety in Public Spaces: The Efficacy of Panic Buttons in New Delhi

Room

We present a qualitative inquiry through the lens of feminist human computer interaction (HCI) into women's perceptions of personal safety in New Delhi, India. Since a brutal gang-rape incident in December 2012 that received global attention, the Indian government has issued a mandate to implement a panic button on every new phone by 2017. We draw on interview and survey data to examine women's reactions to the mandate as well as what factors influence their perceptions of safety, both positively and negatively. Our findings indicate that women's sense of safety may be deconstructed into a multitude of factors--personal, public, social, technological--that must be aligned for this sense of safety to be preserved. We then discuss the implications these factors have for the success and design of the panic button.

Research Focus Areas: Human-Computer Interaction



Ubiquitous Computing Group

We are interested in ubiquitous computing and the research issues involved in building and evaluating ubicomp applications and services that impact our lives. Much of our work is situated in settings of everyday activity, such as the classroom, the office and the home. Our research focuses on several topics including, automated capture and access to live experiences, context-aware computing, applications and services in the home, natural interaction, software architecture, technology policy, security and privacy issues, and technology for individuals with special needs.

Website: <http://ubicomp.cc.gatech.edu>

CampusLife

Room 235A

College students encounter many challenges in the pursuit of their educational goals. When these challenges are prolonged, they can have drastic consequences on health and on personal, social, and academic life. Our multi-institution project, called CampusLife, conceptualizes the student body as a quantified community to quantify, assess, infer, and understand factors that impact well-being. Our goal is to develop privacy-honoring infrastructure and tools that can first sense lifestyle, moods, activities through active and passive techniques, and then utilize that information in the design of self-reflective tools that could make students more self-aware and pro-active toward improving their well-being

Research Focus Areas: Human-Computer Interaction, Mobile and Ubiquitous Computing, Social Computing

COSMOS: Computational Skins for Multi-functional Objects and Systems

Room 235A

COSMOS (COmputational Skins for Multi-functional Objects and Systems) is an interdisciplinary collaborative project to design, manufacture, fabricate, and apply "computational skins". COSMOS consist of dense, high-performance, seamlessly-networked, ambiently-powered computational nodes in the form of 2D flexible surfaces that can process, store, and communicate sensor data. Achieving this vision will redefine the basis of human-environment interactions by creating a world in which everyday objects and information technology become inextricably entangled. This will also enable alternative and neuromorphic computing that can change the foundation of computing today.

Research Focus Areas: Artificial Intelligence, Human-Computer Interaction, Mobile and Ubiquitous Computing

Input for Virtual Reality Environments

Room 235A

A series of demonstrations of novel interactions with virtual reality systems.

Research Focus Areas: Human-Computer Interaction, Virtual Reality, Wearable Computing

Making Smarter Transportation Choices

Room 235A

Driving is the second highest expense for the average American household -- more than food or healthcare, and behind only housing. Yet most people do not understand the total cost of owning and operating their vehicles, and they cannot accurately estimate the cost of a common driving trip (such as a commute from home to work). That's because the costs of owning and operating a vehicle are spread over many expenses incurred at different times. For example, you may fill up the gas tank once a week, make a monthly car payment, and pay insurance twice a year. Depreciation is a significant invisible expense of driving.

We have developed a trip cost meter that makes the total cost of each driving trip visible to the user. We are exploring how this tool can help people make better informed personal transportation decisions, including choice of vehicle and choice of alternate modes of transportation (e.g., Uber, transit, ridesharing, or walking/biking).

Research Focus Areas: Civic Computing, Human-Computer Interaction, Mobile and Ubiquitous Computing

MD2K: Keeping Users Engaged Through Mobile Technology

Room 235A

HCC professionals, psychologists, and many other researchers are interested in understanding how to better influence participant engagement in interventions that involve technology. This is especially true in instances when researchers are not able to provide monetary incentives over an extended period of time. Georiga Tech along with a team at the University of Michigan (working under an NIH-funded MD2K project) are exploring how to keep individuals motivated in such interventions through mobile technology and gamification.

Research Focus Areas: Human-Computer Interaction, Mobile and Ubiquitous Computing

Novel Interactions with Wearable Devices

Room 235A

A series of demonstrations of novel interactions with wearable devices, from smartwatches to head-mounted displays.

Research Focus Areas: Human-Computer Interaction, Mobile and Ubiquitous Computing, Wearable Computing

About GUV Center at Georgia Tech

We've created an unique environment where some of the most progressive work in academic research is being done. Our program has gained international prominence and has become a hotspot for faculty and students committed to developing people-focused, creative, socially relevant technologies.



gvu.gatech.edu

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