GVU Center

Fall Research Showcase

Technology Square Research Building

10.18.17
About Us

GVU Center at Georgia Tech

The GVU Center inspires and enables interdisciplinary research in people-centered computing by advancing a leading network of researchers involved in shaping cutting-edge innovations. GVU has been instrumental in expanding the scope of the research landscape at Georgia Tech for 25 years through the formation of new academic research groups, programs and units, and new interdisciplinary partnerships.

Learn more at http://gvu.gatech.edu
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Interact with our experts at gvu.gatech.edu/explore

**Research**

GVU research includes the spectrum of human activity as it relates to the use of computing technology. Our research ecosystem broadly defines 22 areas where research contributions are made on a continuing basis.

**Organizations**

Researchers represent Georgia Tech's six colleges as well as partners in other research centers. The ability to draw on a wide range of expertise is one of GVU's defining hallmarks.
# Projects by Topic

Projects are listed under one primary topic area with additional areas shown for each

## Artificial Intelligence

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GVU Center Research Showcase
International Development

The Internet in Cuba

Other areas: Online Communities, Social Computing

Mobile and Ubiquitous Computing

RERC TechSAge: ALIGN - Application for Locational Intelligence and Geospatial Navigation

Other areas: Human-Computer Interaction

Epilepsy - Everyday epilepsy self-management tools for patients and families

Other areas: Human-Computer Interaction, Wearable Computing

ThimbleScan: wearable and portable scanners

Other areas: Human-Computer Interaction

GatePal - A context-aware airport guide app for all

Other areas: Human-Computer Interaction

IoT for Cohousing

Other areas: Human-Computer Interaction, New Media

FIDO - Facilitating Interactions for Dogs with Occupations

Other areas: Human-Computer Interaction, Wearable Computing

Data-driven Connected Home

Other areas: Human-Computer Interaction, Requirements Engineering

System for Wearable Audio Navigation (SWAN - Virtual Reality Research Platform)

Other areas: Human-Computer Interaction, Wearable Computing

CampusLife

Other areas: Human-Computer Interaction, Social Computing

Collective Sensing: Building Better Human Networks for Mental Health

Other areas: Human-Computer Interaction, Social Computing

EarBit: Using Wearable Sensors to Detect Eating Episodes

Other areas: Human-Computer Interaction, Wearable Computing

In-context Motion Gesture Design

Other areas: Human-Computer Interaction, Wearable Computing

Music Technology

Sound Happening
New Media

Examining Cultural Representation in Emoji

Other areas: Human-Computer Interaction, Social Computing

Our Driverless Futures: Speculative Moral Dilemmas of Self-Driving Cars

Other areas: Human-Computer Interaction

Robotics

Learning a Unified Policy for Safe Falling

Social Computing

Navigating Media Use: Chinese Parents and Their Overseas Adolescent Children on WeChat

Other areas: Human-Computer Interaction

Intersectional HCI

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Characterising the Mental Health Challenges of LGBTQ Populations Through Computational Analysis of Crisis Conversations

Virtual Reality

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Other

Smart Cities: Design and Human Values

Solar System Sonification Demo

Digital Comicboarding for Visual ODLs - A Co-design Tool to Support Data-Driven Conversations in Pediatric Care
Research Groups and Project Details

Locations listed are for Showcase only and may not represent a lab’s permanent home

ADAM Lab (325) Artificial Intelligence, Human-Computer Interaction, Virtual Reality

The ADAM 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.

Faculty: Brian Magerko, Mark Riedl, Jason Freeman

Learn More at: http://adam.cc.gatech.edu

LuminAI: An Exploration of Human-AI Movement Improvisation

Artificial Intelligence, Cognitive Science, New Media

Brian Magerko, Mikhail Jacob, Lauren Winston, Duri Long, Dor Hananel, Chelsi Cocking, Alexis Perkins

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.

Sound Happening

Music Technology

Agneya Kerure, Dan Singer, Pedro Arevalo, Josh Moore, Duri Long

Sound Happening is a collaborative music-making installation that allows several people to explore and create music in a space by playing with colorful bouncy balls. Using a webcam and Max/MSP, Sound Happening tracks each ball’s location relative to the space to manipulate and trigger various samples, resulting in intriguing sound combinations that are constantly changing as the balls move.
The Shape of Story

Artificial Intelligence

Brian Magerko, Sanjana Gupta, Duri Long, Jessica Brooke Anderson

The Shape of Story is an interactive story circle experience in which participants collectively create a story line-by-line. Artificial intelligence in narrative understanding is used in conjunction with a symbolic visual language in order to visualize this story in real-time. The result is a communally created narrative art piece.

TuneTable

Educational Technologies, Graphics and Animation, Music Technology

Brian Magerko, Jason Freeman, Mikhail Jacob, Ryan Rose, Agneya Kerure, Anna Weisling, Duri Long

TuneTable is a responsive tabletop application with a tangible user interface. The intention is to teach basic computer programming concepts to middle school-aged and high school-aged students using physical blocks that work as snippets of code. Users compose short songs by building chains of blocks that represent code. Each block has a unique design on the bottom that, when placed on the acrylic surface of the table, is identified by the software using cameras mounted underneath the surface of the table. When the arrangement of blocks is recognized, the application outputs musical and visual feedback.

Animal-Computer Interaction Lab (243)

Human-Computer Interaction, Wearable Computing

We explore the emerging area of Animal-Computer Interaction focusing on interfaces for inter-species communication and on the design and evaluation of interactive technology for users of multiple species.

Faculty: Melody Jackson, Thad Starner, Clint Zeagler, Scott Gilliland

Learn More at: http://aci.gatech.edu/

FIDO - Facilitating Interactions for Dogs with Occupations

Human-Computer Interaction, Mobile and Ubiquitous Computing, Wearable Computing

Melody Jackson, Thad Starner, Clint Zeagler, Scott Gilliland, Giancarlo Valentin, Larry Freil, Ryan Kerwin, Ceara Byrne, Joelle Alcaidinho, Jay Zuerndorfer, Lily Burkeen, Zehua Guo

The FIDO Sensors team is creating wearable technology to allow working dogs to communicate. Assistance dogs can tell their owners with hearing impairments what sounds they have heard; guide dogs can tell their owners if there is something in their path that must be avoided. We will be demonstrating a variety of scenarios with five wearable sensors designed for dogs to activate.
Augmented Environments Lab (233)

Augmented Reality, Mobile and Ubiquitous Computing

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.

Faculty: Blair MacIntyre, Jay Bolter

Learn More at: http://ael.gatech.edu/lab/

Argon: AR-Enabled Web Browser

Augmented Reality, New Media

Blair MacIntyre, Jay Bolter, Gheric Speiginer, Colin Freeman, Josh Fisher

Argon is a mobile web browser to bridge the gap between Augmented Reality (AR) and The Web. In the tradition of web browsers like Chrome and Firefox, 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 and applications. The lab has developed tools to make rapid prototyping easier. The goal is to make it possible for designers and organizations with web app skills to create AR and MR (and even VR) applications. Come see projects and demos built using the Argon platform.

Bringing Interactivity to Static Data Visualizations

Augmented Reality, Human-Computer Interaction, Information Visualization

As datasets grow in size and complexity, static visualizations start losing their analytic and expressive power for interactive data exploration. Despite this limitation of static visualizations, there are still many cases where visualizations are limited to being static (e.g., visualizations on presentation slides or posters). We believe in many of these cases, static visualizations will benefit from allowing users to perform interactive tasks on them. Inspired by the introduction of numerous commercial personal augmented reality (AR) devices, we propose a practical AR solution that allows interactive data exploration of datasets on static visualizations.

Invisible Cities: Multi-user AR Public Monuments

Augmented Reality, Collaborative Work, Human-Computer Interaction


Invisible Cities is a mobile dashboard for collaboratively developing AR monuments and expansive artworks in public squares. Users are able to create, share, and maintain public AR works that can be shared with a small community or the entire city. To get started, users download the Georgia Tech Argon
AR browser and visit a public space with AR content. From there, they can engage in creating socially engaged AR with their fellow citizens. In an age of post-truth and fake news, AR public monuments serve as a touchstone for cultural heritage and expression.

**Aware Home Research Initiative (309)**

*Health Informatics, Human-Computer Interaction, Mobile and Ubiquitous Computing*

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, 5,040-square-foot facility designed to facilitate research, while providing an authentic home environment. Research domains include: 1. Health and Well-being, 2. Sustainability, 3. Entertainment, 4. Connected Living / Home Management.

Learn More at: [http://awarehome.gatech.edu](http://awarehome.gatech.edu)  
Faculty: *Brian D. Jones*

**ambient alerting**

*Health Informatics, Human-Computer Interaction, Mobile and Ubiquitous Computing*

Brian Jones, MSEE, Reema Upadhyaya, Akhil Oswal, William Gao, Youssef Asaad, Alex Kim, Jayanth Krihsna  
Older adults are more prone to forgetfulness, which might lead to serious events resulting in costly damage to the home or even injury or death. We feel there is an opportunity, before a family decides to monitor older adults, to use technology to provide gentle reminders or cues that empower residents to determine for themselves when, for example, appliances should be turned off. We have performed Aware Home interviews and prototype evaluations with older adult participants to understand their needs for notifications and preferences for alert (audible and visual).

**Connected Living Experience**

*Human-Computer Interaction, Mobile and Ubiquitous Computing*

Brian Jones, Graduate: Sharon Ang, Jayanth Krihsna, Sunil Nair, Jessica Tsui  
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. The Aware Home is the perfect environment for exploring how smart home systems may be advanced in the future. Student design projects are an opportunity for students to research the preferences of the end users and design prototype systems that will inform this future.
Data-Driven Connected Home

*Human-Computer Interaction, Mobile and Ubiquitous Computing, Requirements Engineering*

Brian Jones, Jayanth M

Using the Z-wave protocol stack, we are building a controller for the Aware Home using a Raspberry Pi that will allow users to control and query device data on a dashboard. This collected data will then be used to predict usage patterns and serve tips for power saving. Finally, a user-friendly rules engine enables users to create certain rules using sensor data.

Flex: Connected Home Integration

*Human-Computer Interaction, Mobile and Ubiquitous Computing*

Brian Jones, William Gao, Jayanth Krishna

Connected-home solutions provider Flex is using Georgia Tech's Aware Home to test devices so they can then show clients how their products would integrate into a home environment. Their Wink Hub is now available as a Do It Yourself solution for the connected home, enabling transfer of messages between in-home devices and the Wink cloud. Devices from different manufacturers with their own dedicated app can now be integrated with the Wink app to provide a more connected consumer experience. During this early phase, Georgia Tech students have helped with testing the Wink Hub in various locations around the Aware Home to ensure reliability of smart devices.

RERC TechSAge: A Mobile Application to Measure Gait Speed

*Health Informatics, Mobile and Ubiquitous Computing*

Brian Jones, David Byrd, Akhil Oswal, Youssef Asaad

Studies show a consistently strong association between gait speed of frail older adults and negative functional (e.g., survival) and activity outcomes. However, health care professionals are slow to measure this physiologic parameter, largely due to the lack of a simple, standardized way of measuring it. This project develops a reliable, simple, and cost-effective mobile app to measure gait speed and demonstrates the feasibility of this measure as a predictive tool to identify risk of functional decline and activity limitations in adults who are aging with ambulatory disability.

RERC TechSAge: SmartBathroom

*Health Informatics, Human-Computer Interaction, Mobile and Ubiquitous Computing*

Jon A. Sanford; Brian Jones; Peter Presti; Brad Fain, Su Jin Lee, Harshal Mahajan, Prasanna Natarajan, Shambhavi Mahajan

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.
CATEA is a multidisciplinary research center devoted to enhancing the lives of people with all levels of ability. Rather than focusing on disability, seeing people as "disabled," we believe that the limitations of current technologies and the design of the built environment account for an individual's inability to perform activities and participate in society. We seek to minimize those limitations through applied research and the development of assistive and universally designed technologies.

Learn More at: https://catea.gatech.edu/  
Faculty: Jon Sanford

GatePal - A context-aware airport guide app for all

*Human-Computer Interaction, Mobile and Ubiquitous Computing*

Jon Sanford, Yilin Elaine Liu, Alex Carroll, Xi Chen

Lack of information provided about airport environments and route conditions makes it difficult for air travelers to plan indoor trips at airports and anticipate possible environmental barriers, which could lead to navigation difficulties. An application that provides real-time environmental information has been designed to facilitate trip planning at airports for travelers, especially those with functional limitations. In this project, we conducted a set of studies to define and further understand the problem of airport navigation and developed a mobile application as the solution. The application will be tested to evaluate its usefulness and usability.

MS Assistant - A Health and Wellness Self-Management App for Individuals Aging with Multiple Sclerosis

*Health Informatics, Human-Computer Interaction, Mobile and Ubiquitous Computing, Aging, Accessibility, Universal Design*

Jon A. Sanford, Ljilja Ruzic Kascak

MS Assistant is a health and wellness self-management app that assists individuals aging with multiple sclerosis (MS) to understand their disease by monitoring all the factors that possibly contribute to the symptoms and keeping track of the changes and what causes them in order to identify triggers and patterns. All that data is available to their healthcare providers with the alerts sent to them in a case of emergency or a special need. The app integrates storing relevant health and wellness data in one place, communicating with other individuals with MS to share information and support, setting up goals, finding needed MS-related information, and more.
RERC TechSAge: ALIGN - Application for Locational Intelligence and Geospatial Navigation

*Human-Computer Interaction, Mobile and Ubiquitous Computing, Universal Design, Accessibility*

Jon A. Sanford, Subhrajit Guhathakurta, Gordon Zhang, Bhanu Verma, Sarah Melgen, Shambhavi Mahajan, Abbinayaa Subramanian, Yilin Elaine Liu

This project will bring together the static (e.g., sidewalk condition, street networks, characteristics of land use) and dynamic (e.g., traffic volumes, weather, and light quality) characteristics of the environment that are monitored close to real time into one decision support system for route planning. The evidence-based app will enhance community mobility by providing up-to-date information about the critical environmental attributes that could affect community mobility and allowing the user to provide information about their own abilities and personal preferences to determine a route that optimizes those preferences.

### Computational Enterprise Science Lab (334)

*Collaborative Work, Health Informatics, Human-Computer Interaction*

The Computational Enterprise Science Lab focuses on the design, analysis, and management of complex enterprise systems (e.g. organizations, supply chains, business ecosystems) using information visualization, modeling/simulation, and system science approaches.

**Learn More at:** cc.gatech.edu/people/rahul-basole

**Faculty:** Rahul Basole

### ecoxight: Visual Business Ecosystem Intelligence

*Information Visualization*

Rahul Basole, Arjun Srinivasan, Hyunwoo Park

Given the rapidly increasing scale, complexity, and rate of change of business ecosystems, as well as economic and competitive pressures, analysts are faced with the formidable task of quickly understanding the fundamental characteristics of these interfirm networks. We have designed and implemented ecoxight, a web-based interactive visualization system that provides capabilities to gain systemic insight into the compositional, temporal, and connective characteristics of business ecosystems. It consists of novel, multiple connected views enabling the analyst to explore, discover, and understand interfirm networks for a focal firm, specific market segments or countries, and the entire business ecosystem.

### Epheno: Visual Sequencing of Enterprise Alliance Portfolios

*Information Visualization*

Rahul Basole, Timothy Major, Arjun Srinivasan

In an increasingly global and competitive business landscape, firms must collaborate and partner with other firms to ensure survival, growth, and innovation. Understanding the evolutionary composition of a firm’ relationship portfolio and the underlying formation strategy is a difficult task given the multi-dimensional, temporal nature of the data. In collaboration with senior executives, we have designed and
implemented an interactive visualization system that enables decision makers to gain both systemic (macro) and detailed (micro) insights into a firm’s relationship activities and discover patterns of multidimensional relationship formation.

Graphiti: Interactive Specification of Attribute-based Edges for Network Modeling and Visualization

*Information Visualization, User Interfaces*
Alex Endert, Rahul Basole, Arjun Srinivasan, Hyunwoo Park

Network visualizations, often in the form of node-link diagrams, are an effective means to understand relationships between entities, discover entities with interesting characteristics, and to identify clusters. We propose an interaction technique to model networks that allows users to demonstrate to the system a subset of nodes and links they wish to see in the resulting network. The system, in response, recommends conditions that can be used to model networks based on the specified nodes and links. We show how our prototype Graphiti not only allows users to model networks from a tabular dataset but also facilitates updating a pre-defined network with additional edge types.

Steering Multidimensional Scaling for Exploring Ego-network Evolution

*Human-Computer Interaction, Information Visualization*
Rahul C. Basole, Po-Ming, Law

Dimensionality reduction (DR) is often used for exploring the evolution patterns of a collection of dynamic ego-networks. However, DR often lacks flexibility: as analysts’ questions evolve during data exploration, the low-dimensional projection remains static, limiting the depth of exploration. To address the inflexibility of DR, we designed a data transformation pipeline which enables analysts to transform dynamic ego-networks into event sequences for steering MDS to create different scatterplots of dynamic ego-networks. Based on the data transformation pipeline, we developed Segue, a visual analytics system for exploring different evolution patterns of ego-networks.

Contextual Computing Group (243)

*Wearable Computing, Human-Computer Interaction*

The Contextual Computing Group (CCG) creates wearable and ubiquitous computing technologies using techniques from artificial intelligence (AI) and human-computer interaction (HCI). We focus on giving users superpowers through augmenting their senses, improving learning, and providing intelligent assistants in everyday life. Members’ long-term projects have included creating wearable computers (Google Glass), teaching manual skills without attention (Passive Haptic Learning), improving hand sensation after traumatic injury (Passive Haptic Rehabilitation), educational technology for the Deaf community, and communicating with dogs and dolphins through computer interfaces (Animal-Computer Interaction).

**Faculty: Thad Starner**

Learn More at: [https://research.cc.gatech.edu/ccg/](https://research.cc.gatech.edu/ccg/)
CopyCat: Helping Young Deaf Children Acquire Language Skills Using Sign Language Recognition

*Educational Technologies, Gaming, Perception*
Thad Starner, Cheryl Wang, Kshitish Deo, Aditya Vishwanath

CopyCat and PopSign are two games that help deaf children and their parents acquire language skills in American Sign Language. Approx. 95% of deaf children are born to hearing parents, and most of those parents never learn enough sign language to teach their children. As short-term memory skills are learned from acquiring a language, many deaf children enter school with short term memory of less than 3 items, much less than hearing children of hearing parents or Deaf children of Deaf parents. Our systems address this problem directly. Even though they are still under development our games have been shown to be effective in multiple user studies.

MICE Learning Tools

*Educational Technologies*
Harley Hamilton

Multisensory Interactive Children’s Electronic (MICE) learning tools provide a new format for electronic dictionaries and books utilizing text, images, speech, and video to maximize learning and comprehension for children.

**Contextualized Support for Learning (330)**

*Educational Technologies, Human-Computer Interaction, New Media*

The Contextualized Support for Learning (CSL) lab has as its aim the creation of "collaborative Dynabooks." We design and implement innovative technology for the goal of improving learning, then empirically explore the benefits and usefulness of the technology with real users. Our vision of collaborative Dynabooks involves inventing new kinds of computer-based media; creating tools to make media composition and sharing easier; helping users to learn how to compose media; developing collaborative supports for reviewing, critiquing, and composing; evaluating our tools and methods in practice; and summarizing and communicating our design lessons learned to inform other designers.

**Faculty: Mark Guzdial**

Learn More at: [http://home.cc.gatech.edu/csl](http://home.cc.gatech.edu/csl)
CSLearning4U: Creating Electronic Books for Teacher and Student CS Learning

*Educational Technologies, Human-Computer Interaction, New Media*

Miranda Parker, Barbara Ericson, Kantwon Rogers (Formerly: Briana Morrison, Stephen Moore)

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.

Pathways and Barriers to Adoption of Computer Science in Schools in Georgia

*Educational Technologies*

Mark Guzdial, Miranda Parker

Educational policy at the state-level is critical to increasing access to Computer Science (CS) in an equitable way through increasing the adoption of CS by public schools. Drawing on a lens of socioeconomic status equity, I plan on exploring the adoption of CS across Georgia. My analysis will create a timeline of maps and statistics of CS in Georgia schools over the last five years, noting policy and curricula developments within each year. From this, I hope to uncover ecological characteristics of schools that adopt CS, as well as patterns of adoption and patterns of non-adoption. Findings will guide future research into the systematic barriers to CS for schools in Georgia.

Sketching to understand the notional machine

*Cognitive Science, Educational Technologies, Computing Education*

Mark Guzdial, Kathryn Cunningham

Sketching and drawing may be especially useful for learning programming, since students face many difficulties understanding the process of code execution, termed the notional machine. Students often have an incomplete mental model of the notional machine, and this misunderstanding of programming language semantics leads to errors in both reading and writing code. If students sketch the process of code execution, they may be able to better track the process of the notional machine. We have found that creating certain types of sketches is correlated with success on code reading problems.
The CAT Lab studies how culture impacts the use and production of technology with a focus on learning applications, computer science education and designing new technologies with culture as a point of convergence.

Faculty: Betsy DiSalvo

Learn More at: http://catlab.gatech.edu/

Design Guidelines for Parent-School Technologies to Support the Ecology of Parental Engagement

*Educational Technologies, Human-Computer Interaction, Online Communities*

Betsy DiSalvo, Marisol Wong-Villacres, Upon Ehsan, Amber Solomon, Mercedes Pozo Buil

Parents' engagement in their children's education is key to their academic success and social development. Little is known about the impact of existing technology designs on the parental ecology. We present findings from 63 interviews with parents and an observation of existing technologies that support parent-school interactions. We found four critical issues that the design of current technologies need to address: (1) inflexibility in the boundaries of digital spaces, (2) inequality, (3) fragmentation and inconsistency of information, and (4) lack of relevant non-academic information. We propose design guidelines for technologies to support the parental ecology.

Designing for Equity in Digital Access through Search Engine Optimization

*Educational Technologies, Human-Computer Interaction*

Betsy DiSalvo, Akansha Gupta

This study examines the role that online search plays in the access to online information resources using access to online Computer Science (CS) education as a case study. First, we conduct a survey with U.S. parents to identify terms used to search for online CS education. Second, we look at the search results for those terms. Third, we analyze the current on-site search engine optimization (SEO) trends among CS education tools. Then we compare the search results and trends to find opportunities to bridge the access gap and provide SEO suggestions to better reach underserved populations.
Exploring Complex Systems Through Interactive Games by Leveraging the Diseases of Chronically Ill Children

*Educational Technologies, Gaming*

*Betsy Di Salvo, Sarah Schoemann, Cheryl Cheong*

We developed a suite of educational digital games for chronically ill children that help us build upon the learning science theory of islands of expertise and contributes to educational game studies by exploring a interrelated core set of games that can teach specific science, technology, engineering and mathematics (STEM) content in the context of complex systems. In this study, we interviewed 20 children with chronic disease and gathered feedback about the mini games developed.

Navigating Media Use: Chinese Parents and Their Overseas Adolescent Children on WeChat

*Human-Computer Interaction, Social Computing, Design*

*Betsy DiSalvo, Rui Zhou, Zhonghe Wen, Muchao Tang*

In this study, we interviewed both Chinese students in the U.S. and Chinese parents in China whose children are studying abroad about their family communications. Parents and students used a variety of media, and families negotiated how each medium was used. Most families eventually migrated to communicate through WeChat, the ubiquitous Chinese based cross-platform instant messaging service. The negotiation of what medium to use, how to use and when to use specific media was tied the students’ and parents’ goals to construct a positive presentation of self. We offer design considerations for cross-cultural, family and intimate long-distance communication media.

The Role of Gesture in Learning Computer Science: How Our Hands Help

*Educational Technologies, Computing Education*

*Betsy DiSalvo, Mark Guzdial, Amber Solomon, Vedant Pradeep, Sarah Li*

The Design & Intelligence Laboratory (229)

*Artificial Intelligence, Cognitive Science*

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.

**Faculty:** *Ashok Goel*, Keith McGregor, Spencer Rugaber

**Learn More at:** [http://dilab.gatech.edu/](http://dilab.gatech.edu/)
Human-Guided Task Transfer in Interactive Robots

*Artificial Intelligence, Cognitive Science, Robotics*

Ashok Goel, Tesca Fitzgerald

As robots become more commonplace, they will need to address a wide variety of problems. Since a robot cannot be programmed to complete every task, it is necessary for robots to learn new tasks by interacting with a human teacher. Current methods require that the robot receive many demonstrations of a task, or they are limited to completing tasks which are nearly identical to previous demonstrations. We are developing a cognitive system based on case-based analogical learning that may enable a robot to collaborate with a human teacher to transfer task knowledge to a range of target problems.

Intelligent Biologically Inspired Design

*Artificial Intelligence, Cognitive Science*

Engineers are interested in solving some practical problem, such as capturing water vapor in arid regions. They intend to use biological analogs as a source of inspiration. IBID uses off-the-shelf NLP tools to parse documents, but goes further by semantically analyzing them. In particular, both the query and target documents are mapped into a common vocabulary, using a taxonomy of function concepts we have developed. That is, we have developed a taxonomy of concepts related to the functioning of complex systems, including both biological and mechanical ones. The ontology serves to bridge the vocabulary gap between the biologist and the engineer.

Virtual Research Assistant: MILA

*Artificial Intelligence, Cognitive Science, Educational Technologies*

Ashok Goel, Robert Bates, Spencer Rugaber, Akshay Agarwal, Christopher Cassion, Taylor Hartman, Animesh Mehta, Abbinayaa Subrahmanian

Big data is an essential element of addressing the challenge of protecting the environment. Encyclopedia of Life (EOL) is the world’s largest database of biological species and other biodiversity information. EOL also works closely with scores of other biodiversity datasets such as BISON, GBIF, and OBIS. We seek to make EOL and related biodiversity data sources accessible, usable, and useful, by integrating extant AI tools for information extraction, modeling and simulation, and question answering; we call the resulting system EOL+. The focus of this project is on the data engineering required for constructing EOL+ and on building a user community around EOL+.

Virtual Teaching Assistant: Jill Watson

*Artificial Intelligence, Cognitive Science, Educational Technologies*

Ashok Goel, David Joyner, Spencer Rugaber, Lalith Polepeddi, Jose Delgado, Bobbie Eicher, Marissa Gonzales, Joshua Killingsworth, Sydni Peterson, Mike Lee, Kunaal Naik, Marc Marone, Roy Hong

It has been said that Jill Watson is the most famous teaching assistant in the world. Jill’s origin actually is quite humble. She was conceived in summer 2015 with the purpose of helping Georgia Tech’s Online MS in CS Program (OMSCS) and specifically with Ashok Goel's online course on knowledge-based artificial intelligence (KBAI) as a part of OMSCS. As a virtual teaching assistant, Jill answered questions in the online discussion forum for online KBAI class. Jill answered only routine, frequently answered questions on the forum, but she did so with close to 100% accuracy and precision, and with an authenticity that the students in the class did not figure out that Jill was actually an AI agent.
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. Projects are often in collaboration with other units on campus, other schools, as well as local non-profit organizations.

Faculty: Nassim JafariNaimi

Learn More at: http://designstudio.gatech.edu

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

Human-Computer Interaction, Information Visualization, Perception
Anne Pollock, Nassim JafariNaimi, Lewis Wheaton, Regan R. Lawson, Shruti Rajeev, Udaya Lakshmi Tattamangalam Ananthanarayanan

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 heart rate of a virtual person, and tracks the eye movements and heart rate of an observing user. We anticipate a mirroring, empathetic physiological response from the user, in which their heart rate also speeds and slows in conjunction with the virtual person. A recording of the experience is available to users.

BellSouth Black Calendar Interactive Installation

Collaborative Work, Educational Technologies, New Media
Nassim JafariNaimi, Brooke Bosley

The goal of this project is to expand on the work done by Pamela Pryor and Jo Edwards (curators of the BellSouth calendar project), to remember, celebrate, and preserve stories of African Americans and Black-owned institutions in Georgia. The project consists of two parts an interactive exhibit and digital application. The exhibit and interactive installation will be located at the APEX (African-American Panoramic Experience) Museum in Atlanta, Georgia.
Bringing Conversation Between: Web Narrative for Reproductive Justice Groups and Molecular Scientists

Aditya Anupam

We seek to discover how two different groups - reproductive justice groups and scientists - as well as the interested public perceive scientific information, surface common themes, and use the findings to inform the design of the collaborative information space. The information space will function as an agora to produce new understandings of gender-balanced reproductive biology and health. From a design perspective, we want to ensure the following questions are answered: What will attract the audience to visit the web narrative?; What will ensure that they stay more than 40 seconds?; What will make them leave the website with motivation to collaborate?

Came From Nothing: An Interactive Documentary

Nassim Jafarinaimi, Nick Tippens

This interactive documentary by GT students chronicles the incredible life story of Benjamin "Big Mouth Ben" Graham, an entrepreneur and motivational entertainer in Atlanta's Historic Sweet Auburn community who overcame 17 years of addiction and homelessness to open a convenience store just two blocks from the same bridge under which he once slept. The feature-length documentary has had successful local screenings and now one of the co-creators aims to deepen and expand its potential impact by designing an interactive version. This digital application creates a new experience for the story's audience, affording them agency over their interactions with its content for a deeper experience.

Our Driverless Futures: Speculative Moral Dilemmas of Self-Driving Cars

Nassim Jafarinaimi, Lorina Navarro

"Our Driverless Futures" is a web-based interactive narrative that critically examines the ethical implications of self-driving cars. Self-driving cars are often positioned as safer and more efficient transportation alternatives, but how should they react in an inevitable fatal accident, and whose lives should they prioritize to save? Informed by STS and feminist discourses, "Our Driverless Futures" advances a critical reflection on algorithmic morality and its consequences. It does so by putting its audience in the shoes of a car buyer confronted with the decision of programming their car in choosing whose lives to save.
Particle in a Box (An Experiential Approach to Quantum Mechanics Education)

*Educational Technologies, Gaming, Information Visualization*

*Nassim Jafarinaimi (DM); Azad Naeemi (ECE), Aditya Anupam, Andy Jin, Nora Hong*

Theories of Quantum Mechanics (QM) have been central to the philosophical and technological advances in physics and related fields. Some of the most important aspects of these theories are outside the bounds of human experience, predominantly explained and taught by drawing on abstract mathematical formulas. This research project addresses whether and how digital media could serve as a basis for experiential understanding of QM concepts. For more information and to play the latest version of an interactive game based upon the rules of QM visit: http://learnqm.gatech.edu.

Smart Cities: Design and Human Values

*Smart Cities; Human Values; Science and Technology Studies*

*Dr. Nassim JafariNaimi, Alyssa Rumsey*

Recent discourses on smart cities have been primarily focused on the deployment of technical infrastructure such as sensor installation, data collection, and security measures. These practices, however, are accompanied with tacit and explicit ideas about ideal cities and human values. This work presents the preliminary results of an ethnographic study that looks closely at the North Avenue Smart Corridor in Atlanta, Ga., aimed at unpacking the driving ideas behind smart cities initiatives and critically engaging its key assumptions of progress and efficiency.

Digital World & Image Group (325)

*Educational Technologies, Human-Computer Interaction, Virtual Reality*

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.

**Faculty: Michael Nitsche**

Learn More at: [http://dwig.lmc.gatech.edu](http://dwig.lmc.gatech.edu)

Archiving Performative Objects

*Gaming, Virtual Reality, Puppetry*

*Michael Nitsche, Pierce McBride*

Many objects lose their meaning when they are archived and usually detached from their original action. This applies particularly to performative objects such as puppets. This project aims to research digital
ways to remediate performative action through game and VR interfaces. The project is a collaboration with the Center for Puppetry Arts. Supported by: NEH Research and Development grant (PR-253380-17)

**Prototyping Puppets - Teaching Circuitry**

*Educational Technologies*

Michael Nitsche, Crystal Eng

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.

**Electronic Learning Communities (338A)**

*Civic Computing, Online 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.

**Faculty:** Amy Bruckman

**Learn More at:** [http://www.cc.gatech.edu/elc/index.shtml](http://www.cc.gatech.edu/elc/index.shtml)

**Moderation Practices on Reddit Communities**

*Human-Computer Interaction, Online Communities, Social Computing*

Amy Bruckman, Shagun Jhaver, Iris Birman

Our study will focus on the motivation behind Reddit moderators’ decisions to consider comments, concentrating on the top 100 most popular (by number of subscribers) subreddits. From these, we will select a purposeful sample of subs with the most restrictive policies, moderately restrictive policies, and least restrictive policies. Selecting two subs from each group, we will conduct structured interviews of five to ten mods per sub. Our interviews will focus on their attitudes towards free speech versus appropriateness, decisions they find challenging, what factors contribute to consistency across different mods, software use and its limitations, and what they most need help with.

**The Internet in Cuba**

*International Development, Online Communities, Social Computing*

Amy Bruckman, Neha Kumar, Michaelanne Dye

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.

### Entertainment Intelligence Lab *(228B)*

*Artificial Intelligence, Gaming*

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.

**Faculty:** *Mark Riedl*

**Learn More at:** [https://research.cc.gatech.edu/eilab/](https://research.cc.gatech.edu/eilab/)

### Automatically Generating Game Levels from Gameplay Videos

*Artificial Intelligence, Gaming*

**Mark O. Riedl, Matthew Guzdial**

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, constructing such agents takes time and knowledge. 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.

### Explainable AI

*Artificial Intelligence, Gaming*

**Mark Riedl, Brent Harrison, Upol Ehsan**

In the near future, autonomous and semi-autonomous systems will interact with us with greater frequency. When they fail or perform unexpected behaviors, non-experts must be able to determine what went wrong. We introduce rationalization, a technique for automatically generating natural language explanations as if another human were describing what the autonomous system was doing. We demonstrate rationalization in the test-bed domain of the Frogger game.

**Video:** [https://www.youtube.com/watch?v=vXcuLEBwXsQ](https://www.youtube.com/watch?v=vXcuLEBwXsQ)
Interactive Improv Storytelling AI

*Artificial Intelligence, Cognitive Science, Natural Language Processing*

Mark Riedl, Lara Martin, Prithviraj Ammanabrolu, Xinyu Wang, Richa Arora, Pradyumna Tambwekar

Improvisational storytelling involves one or more people interacting in real-time to create a story without advanced notice of topic or theme. Human improvisation occurs in an open-world that can be in any state and characters can perform any behaviors expressible through natural language. In this project, we strive toward the grand challenge of computational improvisational storytelling in open-world domains. The goal is to develop an intelligent agent that can sensibly co-create a story with one or more humans through natural language.

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**Everyday Computing Lab (343)**

*Human-Computer Interaction, Online Communities*

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.

Faculty: *Beth Mynatt*

Learn More at: [https://research.cc.gatech.edu/ecl/](https://research.cc.gatech.edu/ecl/)

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**Epilepsy - Everyday epilepsy self-management tools for patients and families**

*Human-Computer Interaction, Mobile and Ubiquitous Computing, Wearable Computing*

Beth Mynatt, Jonathan Bidwell

Many patients and caregivers struggle to complete everyday epilepsy self-management practices: remembering to take daily medications, reporting seizure events, and self-regulating behaviors such as getting enough sleep. We are working with adolescent patients (11-18 years old), caregivers, and clinicians from the Children’s Healthcare of Atlanta (CHOA) to investigate how mobile and wearable health tracking technologies can support these everyday self-management needs. This work seeks to contribute to technology design implications for improving upon current epilepsy self-management tools available to patients and families.
Epilepsy - Health dashboard for remote patient outreach

*Health Informatics, Human-Computer Interaction*

Beth Mynatt, Jonathan Bidwell

We are working with 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. 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.

Exploring the connections between social networks, eating disordered content, and clinical practices

*Health Informatics, Social Computing*

Elizabeth D. Mynatt, Jessica A. Pater

Self-harm is the infliction of pain or injury onto oneself. This research aims to do the following:
- Define the concept of digital self-harm as the online communication and activity that leads to, supports, or exacerbates, non-suicidal yet intentional harm or impairment of an individual’s physical wellbeing.
- Ground-truth public data analysis of online eating disorder content with actual patients.
- Understand how patients and clinicians perceive the influence of social media with respect to eating disordered behaviors and activities.
- Explore correlations between online activity and offline disease presentation.

MyPath: Personalized and Adaptive Support for Cancer Patients

*Health Informatics, Human-Computer Interaction, Mobile and Ubiquitous Computing*

Beth Mynatt, James Clawson, Maia Jacobs, Florian Foerster

We explore the ability for personalized, adaptable, mobile tools to support patients over the course of their individual cancer journeys. Technology needs to anticipate and recognize barriers to care that occur at various points in a cancer journey, adapt with patients as they navigate these barriers, and successfully provide them with tools and resources needed to manage and mitigate barriers. Our goal 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.
Graphics Lab (230C)

The Graphics Lab is dedicated to research in all aspects of computer graphics, including animation, modeling, rendering, image and video manipulation and augmented reality.

Faculty: Karen Liu, Greg Turk, Jarek Rossignac, Irfan Essa, Jim Rehg, Blair MacIntyre

Learn More at: https://www.cc.gatech.edu/graphics/

Data-Driven Approach to Simulating Realistic Human Joint Constraints

Karen Liu, Greg Turk, Alex Clegg, Jie Tan

Dressing is one of the most common activities in human society. Perfecting the skill of dressing can take an average child 3-4 years of daily practice. The challenge is primarily due to the combined difficulty of coordinating different body parts and manipulating soft and deformable objects (clothes). We present a technique to synthesize human dressing by controlling a human character to put on an article of simulated clothing. We identify a set of primitive actions which account for the vast majority of motions observed in human dressing. These primitive actions can be assembled into a variety of motion sequences for dressing different garments with different styles.

Human Behavior Simulation for Robot-Assisted Dressing

C. Karen Liu, Greg Turk, Charlie C. Kemp, Alexander Clegg, Wenhao Yu

We investigate robotic assistants for dressing that can anticipate the motion of the person who is being helped. To this end, we use reinforcement learning to create models of human behavior during assistance with dressing. We apply recent advances in Deep Reinforcement Learning (DRL) to train motor control policies capable of simulating human behavior during dressing tasks.

Learning a Unified Policy for Safe Falling

Karen Liu, Visak Kumar

Being able to fall safely is a necessary motor skill for humanoids performing highly dynamic tasks, such as running and jumping. We propose a new method to learn a policy that minimizes the maximal impulse during the fall. The optimization solves for both a discrete contact planning problem and a continuous optimal control problem. Once trained, the policy can compute the optimal next contacting body part (e.g. left foot, right foot, or hands), contact location and timing, and the required joint actuation.
Learning a Universal Policy with Online System Identification

Artificial Intelligence, Graphics and Animation, Robotics
Greg Turk, C. Karen Liu, Wenhao Yu

We present a new method of learning control policies that successfully operate under unknown dynamic models. We create such policies by leveraging a large number of training examples that are generated using a physical simulator. Our system is made of two components: a Universal Policy (UP) and a function for Online System Identification (OSI). Together, UP-OSI is a robust control policy that can be used across a wide range of dynamic models, and that is also responsive to sudden changes in the environment. We have evaluated the performance of this system on a variety of tasks and it is effective across a wide range of dynamic models.

GT-Bionics Lab (223)

Human-Computer Interaction, Wearable Computing

We design and develop state-of-the-art medical and scientific instruments for a wide variety of clinical and research applications. Our focus is on Assistive Technologies, Rehabilitation Engineering, Wearable Devices for Smart Health and Wellbeing, Implantable Microelectronic Devices, and Wireless Neural Interfacing. We are involved in true multidisciplinary research addressing all aspects of complex biomedical systems from hardware, software, and smart algorithm design to evaluation of their full functionality and efficacy on animal subjects or in clinical settings.

Faculty: Maysam Ghovanloo

Learn More at: http://gtbionics.ece.gatech.edu/

Multimodal Speech Capture System

Graphics and Animation, Information Visualization, Wearable Computing, Speech Science
Maysam Ghovanloo, Nordine Sebkhi

GT-Bionics lab is developing a Multimodal Speech Capture System (MSCS) to assist speech-language pathologists (SLPs) in their therapy sessions for many applications, including identifying and correcting errant speech, correct pronunciation and/or accent of second-language learners and native speakers that hold positions in which verbal communication is crucial. In addition to being commercially viable for SLPs’ private practices, MSCS can also be used for speech recognition by enabling people, with limited abilities to produce voice, to communicate through text and/or computer-generated voice.
Health Experience & Applications Lab (346)  
*Health Informatics, Human-Computer Interaction*

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.

**Faculty:** Lauren Wilcox

Learn More at: [http://www hx.gatech.edu](http://www.hx.gatech.edu)

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Rapport: Pediatric Patient and Family Oriented Radiology Report  
*Health Informatics, Human-Computer Interaction*

Lauren Wilcox, Matthew Hong, Clayton Feustel, Max Silverman, Meeshu Agnihotri

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.

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Human Factors & Aging Lab (346)  
*Human-Computer Interaction*

At Georgia Tech, human factors and aging is studied from the broad perspective representative of the field of human factors. The Human Factors and Aging Laboratory is specifically oriented toward developing a fundamental understanding of aging, cognition, and attention. The Human Factors and Aging Laboratory is also committed to bringing that fundamental basic knowledge to bear on design issues important to the quality and safety of activities of daily living encountered by older adults.

**Faculty:** Wendy A. Rogers

Learn More at: [http://hfaging.gatech.edu](http://hfaging.gatech.edu)
Validating a Conceptual Model of Spatial Presence to Enhance Virtual Reality Applications for Older and Younger Adults

Artificial Intelligence, Human-Computer Interaction, Virtual Reality

Wendy A. Rogers, Sean A. McGlynn

Research has shown that virtual reality applications such as entertainment, physical and therapeutic interventions, social interaction, and training tend to be more effective and enjoyable when users experience spatial presence in the virtual environment. Our current study aims to validate a conceptual model of spatial presence in virtual reality with an emphasis on potential age-related differences in if/how the 'sense of being' is formed and maintained. Findings will provide insights into designing virtual reality experiences that increase their effectiveness for users of various ages.

### Information Interfaces Group (334) Information Visualization

At the Information Interfaces Group, computing technologies are developed that help people take advantage of information to enrich their lives. The lab develops ways to help people understand information via user interface design, information visualization, peripheral awareness techniques and embodied agents. The goal is to help people make better judgments by learning from all the information available to them.

Faculty: **John Stasko**

Learn More at: [http://www.cc.gatech.edu/gvu/ii/](http://www.cc.gatech.edu/gvu/ii/)

### Data Illustrator

**Human-Computer Interaction, Information Visualization**

**John Stasko, John Thompson**

Data Illustrator is a vector editing tool for creating data visualizations and infographics. Graphic designers can use Data Illustrator to craft their own visualizations by repeating and styling shapes with data-driven rules. The tool supports the creation of expressive, flexible, and parametrically defined visualizations without the need to program them.

### Orko: Multimodal Interaction for Exploring Network Visualizations

**Human-Computer Interaction, Information Visualization**

**John Stasko, Arjun Srinivasan, Ayshwarya Saktheeswaran**

Data visualization systems have predominantly been developed for WIMP-based direct manipulation interfaces. Prior evaluations of natural language interfaces for visualization have indicated potential value in combining direct manipulation and natural language as complementary interaction techniques. However, little work has been done in exploring such multimodal visualization interfaces. Orko is a visualization we have created to allow people to explore data using speech and touch-based multimodal
interaction. We try to bridge the gap between existing direct manipulation based interfaces and hypothesized futuristic natural user interfaces for data analysis with visualization.

**SpaceSketch - Multitouch Exploration of Urban Public Safety Data**  
*Human-Computer Interaction, Information Visualization*  
John Stasko, Alex Godwin

Visualization tools for spatio-temporal data utilize map-based representations to help a user understand trends and outliers within a given region over time. Multitouch visualization tools allow us to recreate many of the capabilities of sketching directly on maps while still taking advantage of computational models of public safety. We will be demonstrating SpaceSketch, a multitouch approach to spatio-temporal visualization. Visitors will be allowed to explore crime and transit data in the city of Atlanta using our high-resolution Perceptive Pixel Interface.

**Visualizing the Top Golf Courses in the US**  
*Information Visualization*  
John Stasko, Josh Kulas

We have created a visual interface to explore the history of the top 100 U.S. golf course rankings from Golf Digest and Golf Magazines. A viewer can explore the courses geographically via a map or through the individual ordered lists from the magazines. The system shows how each course's ranking has changes over the years, and it allows the viewer to explore courses by particular architects.

**Interactive Product Design Lab (304)**  
*Human-Computer Interaction, Mobile and Ubiquitous Computing, Wearable Computing*

IPDL is a purpose-built lab designed to support both teaching and research by allowing students to investigate, explore, and experiment with an extensive array of new technologies. Central to this concept, the School of Industrial Design has placed a high priority on the need to foster and develop interdisciplinary, team-based collaboration with other educational and research units from across the campus. The lab opened in fall semester 2011.

Faculty: Jim Budd  
Learn More at: [http://ipdl.gatech.edu/](http://ipdl.gatech.edu/)

**The Light Orchard**  
*Collaborative Work, Human-Computer Interaction, Information Visualization*  
James Hallam, Clement Zheng, Noah Posner, Heydn Ericson, Matthew Swarts

The Light Orchard is an interactive installation that invites people to walk into a grove of futuristic trees, lit with color. The trees are aware of the presence of people in their space, and can respond in many different
ways. User can play different games, watch animations, and work together with different simulations, that allow them to easily collaborate, learn, and play together.

### MS-HCI Project Lab (324) Human-Computer Interaction

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.

**Faculty:** Richard Henneman, Carrie Bruce

**Learn More at:** [http://mshci.gatech.edu/research/labs](http://mshci.gatech.edu/research/labs)

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### Data Documentary

*Civic Computing*

Yanni Alexander Loukissas, Lu Dong

Understanding and visualizing pedestrian accidents on Buford Highway.

### ThimbleScan: wearable and portable scanners

*Human-Computer Interaction, Mobile and Ubiquitous Computing*

Keith Edwards, John Crisp

Have you ever seen printed text in the environment, and wanted to retain that information? Did you stop and type it in, or did you take a picture of it? This project explores user needs and interaction when capturing textual information, including scanning, converting into digital, and directing to a destination such as a text or an email. With a goal of designing and evaluating a prototype solution, this project has included constructing a wearable scanner, and reviewing existing solutions such as handheld scanners and smartphone-based apps.
Participatory Publics Lab (209)

Civic Computing, Mobile and Ubiquitous Computing

The Participatory Publics Lab is concerned with community engagement and design. We explore the design of mobile and social media in the context of community development and activism. We do this through the design of technologies, development of discourses about them and in their use, adoption, and appropriation. We investigate forms of civic and community engagement through participatory design, design research, ethnographic research, and critical scholarship.

Faculty: Christopher Le Dantec

Learn More at: http://dm.lmc.gatech.edu/research/labs/participatory-publics-lab/

Cycle Atlanta

Civic Computing

Kari Watkins and Chris Le Dantec

Half of all trips are three miles or less, yet only 1.8 percent of those trips are biked. This is in part due to a lack of safe infrastructure, bicycle lanes on roadways, or other resources. Our project, Bicycle Route Desirability, aims to modify the open-source CycleTracks application for use in Atlanta. CycleTracks tracks the existing routes of cyclists using their smart phones and allows comparison of these routes to the quickest path from origin to destination. This allows us to begin to recommend appropriate infrastructure improvements to the most traveled routes in a study area by seeing logical paths that cyclists avoid.

Prototyping eNarrative Lab (322) HCI, Virtual Reality

The Prototyping eNarrative Lab (PeN Lab) at Georgia Tech applies digital information design and interaction design principles to digital storytelling to create more complex and expressive narratives, focusing on emerging platforms like experimental television, virtual reality, and augmented reality, and on the intersection of storytelling with game design and simulation design.

Faculty: Janet Murray

Learn More at: http://etv.gatech.edu
ARES

Gaming, Human-Computer Interaction, Virtual Reality


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.

Digital Comicboarding for Visual ODLs - A Co-design Tool to Support Data-Driven Conversations in Pediatric Care

Janet Murray, Sanat Rath, Sruthi Padala, Vipul Thakur

A collection of projects that explore the convergence of entertainment formats and computation, with focus on HCI design and research methods.
Sanat Rath: Giggles, an application to help viewers relive moments from their favorite sitcoms.
Sruthi Padala: A second screen application for the popular TV show 'The Voice'.
Vipul Thakur: Talkista, an application that serves as your information resource, companion in conferences, meetups and classrooms.
Amrutha Krishnan: Newspad, design of a second screen application for news that enables viewers to understand the news better by providing them the required context as well as supplementary information.

Encounter - A Stat Trek Story

Gaming, Human-Computer Interaction, Virtual Reality

Janet Murray, Philippe Kimura-Thollander, Chris Purdy, Qing Tian, Xinyi Chen

You are on a mission to foreign planets with the company of your captain. While landing on the planet in a transporter, you need to show hospitality to the alien representative with gestures since no translators to the alien culture are present. You need to mimic the gestures of the alien representative and establish a diplomatic relationship.

SteamPumpT

Gaming, Human-Computer Interaction, Virtual Reality

Janet Murray, Joshua Crisp, Kamryn Harris, Elizabeth Hill, Miro Malesvic

Compete in an immersive steam punk environment hot-air-balloon race against your arch nemesis using a custom VR controller. The evil nemesis has sabotaged your balloon and stolen your robot, now you must work against the odds to keep your balloon afloat, save your robot, and prove you are the best inventor in Mountaintown! This game makes use of a specialized controller that combines a familiar motion with pressure sensitive pump to provide realtime feedback and a deeper immersive experience.

Trespass

Virtual Reality

Ricky Yu, Sea Wu, Edward Zhang, Charlie Denton

Trespass invites players to step into the shoes of an archetypal ninja and play through a thrilling interactive vignette of Japanese history. The story is based in part on historical accounts of the life of Ishikawa Goemon, a well known ninja of the 16th century. Our intention in building Trespass is to explore how
players respond to spatial barriers in the virtual world. By utilizing HTC Vive and Unity, Trespass will immerse the player in grand digital rooms and subtle performances of stealth. Additionally, the game takes advantage of the affordances of VR by allowing players to physically walk around digital spaces that are "folded" to fit within the boundaries of a much smaller physical room.

Public Design Workshop (209) New Media

The Public Design Workshop is a pedagogically structured lab 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.

Faculty: Carl DiSalvo

Learn More at: http://publicdesignworkshop.net

IoT for Cohousing

Human-Computer Interaction, Mobile and Ubiquitous Computing, New Media
Carl DiSalvo, Tom Jenkins

"Domesticity" is comprised of all sorts of objects in the home. By providing computational capabilities to materials in the home, the Internet of Things (IoT) 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 IoT. These outliers - cohousing communities, tiny homes, combination live/work spaces, 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.

Stream Cleaning: Simulation Revealing Impact of Urban Creek Contamination on Nearby Residents

Civic Computing, Educational Technologies, Human-Computer Interaction
Carl DiSalvo, Janet Murray, Morgan Orangi

Contamination in urban creeks is a major problem especially in neighborhoods that sit along sections of the creek that get contaminated and dumped in. Most often, this happens in lower-income neighborhoods where many residents are unaware of trash/recycling guidelines and the local government doesn't feel accountable for the residents’ actions. With our simulation, interactors learn what they can do in the real world to help solve this problem by taking on the role of a resident in a neighborhood along a contaminated creek. Through the simulation, they realize what types of events occur in the neighborhood and how their choices impact the creek's cleanliness and the community.
Social Dynamics & Wellbeing Lab (341B)

Health Informatics, Social Computing

We study, mine, and analyze social media to derive insights and develop mechanisms toward improving our health and well-being. As social media technologies are adopted more pervasively, the line between our online and offline lives is disappearing slowly but steadily. Content shared on these platforms often revolves around day-to-day happenings and experiences in our personal lives, and in our physical and social environments. As such, social media provides a means to capture attributes relevant to our thinking, mood, communication, activities, socialization, and psychological states. We employ this rich repository of information in addressing outstanding challenges relating to personal and societal well-being.

Faculty: Munmun De Choudhury

Learn More at: http://www.munmund.net/

Characterising the Mental Health Challenges of LGBTQ Populations Through Computational Analysis of Crisis Conversations

Social Computing
Munmun De Choudhury, Eva Sharma

This research project aims to develop computational and analytic approaches that can utilize Crisis Text Line’s conversations to examine, quantify, and understand “minority stress” and thereafter glean meaningful insights into the unique mental health challenges and needs of LGBTQ (Lesbian, Gay, Bisexual, Transgender, Queer) individuals.

THRIVE: Technology & Health Related Information to improve wellness
Health Informatics, Social Computing
Munmun De Choudhury, Sindhu Kiranmai Ernala
The Georgia Tech Sonification Lab is an interdisciplinary research group based in the Schools of Psychology and Interactive Computing. The 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." We often work with people who cannot look at, or see, traditional visual displays in order to develop assistive technologies for the visually impaired. Our collaborative research projects often include empirical (lab) studies, software and hardware development, field studies, usability investigations, and focus group studies.

Faculty: Bruce N. Walker

Learn More at: http://sonify.psych.gatech.edu

Accessible Weather Apps

Educational Technologies, Human-Computer Interaction, Information Visualization
In collaboration with: PhET Interactive Simulations project from University of

The graphs and figures that are so prevalent in math and science make those topics largely inaccessible to blind students. In collaboration with the Georgia Academy for the Blind and the Center for the Visually Impaired of Atlanta we are working on auditory graphs that represent equations and data to those who cannot see a visual graph. Our research looks at teaching astronomy concepts and understanding weather information through a combination of sonification and auditory description. We have an ecosystem of software and hardware solutions, both desktop and mobile, to help in this space.

Air Gestures in the Vehicle

Human-Computer Interaction, Mobile and Ubiquitous Computing
Bruce Walker, Keenan May, Thomas Gable, Shawn Wu, Ruta Sardesai

Modern sensor technology is beginning to allow for cost-effective deployment of air gesture interfaces in the vehicle. Unlike the current standard of direct touch, air gesture interfaces do not require that drivers take their eyes off the road, especially when coupled with properly applied auditory or tactile feedback. We are developing guidelines for automotive interface designers on how to create air gesture interfaces which provide minimal cognitive, motor and visual demand to drivers. We combine user-centered HCI design with comprehensive engineering psychology evaluation to take a data-driven approach to air gesture systems in the vehicle.
Automated Driving Displays: Multi-system Reliability Displays

*Human-Computer Interaction, Information Visualization, Mobile and Ubiquitous Computing*

*Bruce Walker, Brittany Noah, Thomas Gable*

Automated safety systems, a first step toward autonomous vehicles, are already available in 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 they must understand and appropriately trust the technology. We are investigating personal characteristics and driving environments that influence acceptance and use of automated safety systems and developing multimodal displays to increase situation awareness.

iPad Cognitive Assessment

*Cognitive Science, Human-Computer Interaction, Mobile and Ubiquitous Computing*

*Bruce Walker, Zoe Becerra*

The iPad Cognitive Assessment project is exploring building a cognitive battery that assesses cognitive functions necessary for safe driving. We are currently building a research tool to evaluate the reliability, validity, and correlation of various cognitive tasks.

PhET Educational Tools Teacher Survey

*Educational Technologies, Human-Computer Interaction, Information Visualization*

*Bruce Walker, Jonathan Schuett, Brianna Tomlinson, Jared Batterman, Jonathan Schuett, Brianna Tomlinson, Jared Batterman, Mike Winters, Zachary Kondak, Henry Wang, Prakriti Kaini, TJ Funso. In collaboration with: PhET Interactive Simulations project*

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PhET Simulation Sonification Development

*Educational Technologies, Human-Computer Interaction, Information Visualization*

*Bruce Walker, Jonathan Schuett, Brianna Tomlinson, Jared Batterman, Jonathan Schuett, Brianna Tomlinson, Jared Batterman, Mike Winters, Zachary Kondak, Henry Wang, Prakriti Kaini, TJ Funso. In collaboration with: PhET Interactive Simulations project*

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Solar System Sonification Demo

*Bruce Walker, Brianna Tomlinson, Mike Winters, Chris Latina, Smruthi Bhat, Milap Rane*

Students in the Sonification Lab and Center for Music Technology designed Solar System Sonification, an auditory experience of the planets. Using non-speech audio to convey information, they built a musical
model of the solar system. Planetariums typically rely on visuals with various levels of speech description, but have not explored using auditory cues to present information about space. Auditory displays, like the ones developed for Solar System Sonification, enable more immersive experiences and make information accessible to people with visual impairments.

System for Wearable Audio Navigation (SWAN - Virtual Reality Research Platform)

*Human-Computer Interaction, Mobile and Ubiquitous Computing, Wearable Computing*

Bruce Walker, Jeff Wilson, Phillip Roberts, Lusenii Kromah

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.

Understanding Technology Categorization

*Human-Computer Interaction*

Dr. Bruce Walker, Rachel Stuck

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**TanDEm (330) Human-Computer Interaction, International Development**

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*

Learn More at: [http://tandem.gatech.edu/](http://tandem.gatech.edu/)

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Examining Cultural Representation in Emoji

*Human-Computer Interaction, New Media, Social Computing*

Philippe Kimura-Thollander

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Exploring Applications for Sexual and Reproductive Health

*Human-Computer Interaction, International Development*

Neha Kumar, Azra Ismail, Naveena Karusala

Our group explores the concept of place as a determining factor in the design of healthcare interventions that seek to target specific underserved communities. Our ethnographic study on healthcare access in marginalized communities demonstrates that the prevalent medical conditions, informedness about
healthy behaviors, medical practice, and perceptions around health are highly situated and influence how and where people seek healthcare. We use our findings to guide the design of interventions that take into account this situated nature of healthcare.

**Storytelling with Virtual Reality in Atlanta and Mumbai**

*Educational Technologies, Human-Computer Interaction, Virtual Reality*

Neha Kumar, Aditya Vishwanath

Our research examines the role that low-cost virtual reality (VR) technology could play in supporting learning in low-resource contexts. We propose creating affordable VR based learning experiences for children in these contexts. With the rising penetration of low-cost mobile technologies and internet connectivity in under-resourced communities, we are exploring VR to enhance learning experiences for low-resource contexts. We introduce 'inspirit' - a free mobile platform for hosting VR based learning content for the classroom. Visit www.inspiritvr.org; download our mobile application from the Google Play Store.

**Understanding Approaches to Adolescent Health**

*Collaborative Work, Human-Computer Interaction, International Development*

Neha Kumar, Shruti Dalvi

Cultural taboos and inflexible social norms make it challenging to teach and communicate about menstrual health education in India. We present an investigation of current approaches used to educate adolescents about menstruation, examining the perspectives of parents, teachers, social workers, and health professionals for identifying design opportunities and potential for impact. There is also a palpable difference in attitudes regarding who must be taught, how, where, and when. We articulate factors that could shape access and receptivity to this knowledge. This project is in collaboration with scholars in India.

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**Ubiquitous Computing Group (234-238)**

*Mobile and Ubiquitous Computing, Information Visualization*

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.

**Faculty: Gregory Abowd**

Learn More at: [http://ubicomp.cc.gatech.edu](http://ubicomp.cc.gatech.edu)
Amazing Me: Milestone tracking via an interactive e-book

*Health Informatics, Mobile and Ubiquitous Computing*
Rosa Arriaga, Yiran Ma

Early development of children is a critical issue for parents, but they may fail to recognize symptoms of abnormalities or seek help at an early stage. CDC distributed brochures to promote knowledge of children’s early development, but the large volume of information still requires dedicated time to discover relevant topics. Our project enhances the collaboration among parents, childcare givers, and professionals to make the most impact with this information. Our solution utilizes a tablet-based interactive storybook to intervene with milestone tracking and help improve chronic/health care management.

CampusLife

*Human-Computer Interaction, Mobile and Ubiquitous Computing, Social Computing*
Gregory Abowd, Munmun De Choudhury, Lauren Wilcox, Kaya De Barbaro,

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.

Collective Sensing: Building Better Human Networks for Mental Health

*Human-Computer Interaction, Mobile and Ubiquitous Computing, Social Computing*
Gregory Abowd, Rosa Arriaga, Jung Wook Park, Hayley Evans

Collective sensing is a novel mobile technology which aims to build better human networks. It uses multiple informants to collect information regarding an individual in a variety of contexts with the goal of creating a more holistic story.

COSMOS: COmputational Skins for Multi-functional Objects and Systems

*Artificial Intelligence, Human-Computer Interaction, Mobile and Ubiquitous Computing*
Gregory Abowd, Alan Dingtian Zhang, Nivedita Arora, Felix Tener, Eui Min Jung

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

EarBit: Using Wearable Sensors to Detect Eating Episodes

*Human-Computer Interaction, Mobile and Ubiquitous Computing, Wearable Computing*

We demonstrate a wearable system that detects eating instances in real time.
In-context Motion Gesture Design
*Human-Computer Interaction, Mobile and Ubiquitous Computing, Wearable Computing*
Gregory D. Abowd, Thad Starner, Pratik Shah, Aman Parnami, Gabriel Reyes

Motion gestures can be expressive, fast to access and perform, and facilitated by ubiquitous inertial sensors. Implementing a gesture recognizer requires substantial programming and pattern recognition expertise. We present a mobile tool for in-context motion gesture design. Our tool allows interaction designers to create and test motion gestures using inertial sensors in commodity and custom devices. Therefore, our tool encourages development of gestures with common as well as atypical body parts. Moreover, the data collection, design, and evaluation of envisioned gestural interactions can now occur within the context of its use.

Making Smarter Transportation Choices
*Civic Computing, Human-Computer Interaction, Mobile and Ubiquitous Computing*
Gregory D. Abowd, Caleb Southern, Yunnuo Cheng, Vedant Das Swain, Cheng Zhang

Driving is the second highest expense for the average American household – behind only housing – yet most people do not understand the total cost of owning and operating their vehicles. These costs are spread over many expenses incurred at different times, with depreciation a significant invisible expense. 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).

MD2K: Engagement Wrapper - Keeping Users Engaged Through Mobile Technology
*Health Informatics, Human-Computer Interaction, Mobile and Ubiquitous Computing*
Gregory Abowd, Yilin Elaine Liu, Linlu Zhou, Hayley Evans

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. Georgia 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.

Visual Analytics Lab (334) *Information Visualization*

Our goal is to help people make sense of data. We research and develop interactive visualizations that couple machine learning with visual interfaces of data for exploration and sensemaking.

Faculty: Alex Endert

Learn More at: [http://va.gatech.edu/](http://va.gatech.edu/)
Podium: Ranking Data Using Mixed-Initiative Visual Analytics

*Human-Computer Interaction, Information Visualization*

Alex Endert, Emily Wall, Subhajit Das, Ravish Chawla

People often rank and order data items as a vital part of making decisions. Multi-attribute ranking systems help in this goal but assume that users are able to quantify their conceptual understanding of how important particular attributes are. We present an application that ranks multi-attribute data based on a user’s interactions. Our system, called Podium, allows users to drag rows in the table indicating where they think data items belong based on their knowledge or preferences. Our system then infers a weighting model that satisfies the user’s preferences as closely as possible.

Visualization by Demonstration

*Human-Computer Interaction, Information Visualization*

Warning, Bias May Occur: Detecting Cognitive Bias in Visual Analytics

*Cognitive Science, Human-Computer Interaction, Information Visualization*

Alex Endert, Emily Wall

Visual analytic tools provide interactive interfaces to help people gain insights and understanding about data. Such tools show visualizations depicting the output of analytic models. People can explore different views, change model parameters, and control aspects of the system through user interaction that allow them to ask questions of the data and see responses visually. However, little consideration has yet been given to the ways inherent human biases might shape the visual analytic process. We describe five preliminary metrics for detecting cognitive bias based on users’ interactions and show how these metrics might be used in a visual analytic system.

Work2Play *(330)*  
*Health Informatics, Human-Computer Interaction, Int’l Development*

Computing affects our lives, shaping not just how we work, but also how we play. It potentially allows individuals to blur the boundaries by letting us conduct domestic routines while in the office, or working from a cafe in an urban centre. Researchers in the Work2Play lab are interested in using a variety of empirical techniques to advance the state of the knowledge in how computing affects our lives from work to play. Following Human-Centered and Human-Computing we conduct field studies, develop insights, deploy ICTs and evaluate impact. Past research has laid the foundation for the Work2Play lab by examining communication and coordination in both work and recreational settings.

**Faculty:** *Rebecca (Beki) E. Grinter*

**Learn More at:** [http://www.cc.gatech.edu/~beki/wpl/Work2Play.html](http://www.cc.gatech.edu/~beki/wpl/Work2Play.html)
Intersectional HCI

*Human-Computer Interaction, Social Computing*

*Rebecca E. Grinter, W. Keith Edwards, Ari Schlesinger*

Understanding users becomes increasingly complicated when we grapple with various overlapping attributes of an individual’s identity. We introduce intersectionality as a framework for engaging with the complexity of user identities, and situating these identities in relation to their contextual surroundings. We conducted a meta-review of identity representation in the CHI proceedings, collecting a corpus of 140 manuscripts on gender, ethnicity, race, class, and sexuality published between 1982-2016. We analyze how identity is constructed and represented in CHI research to examine intersectionality in a human-computer interaction (HCI) context.
Thank You

for being a part of the GVU Center Research Showcase at Georgia Tech.

We look forward to learning more about your needs and interests. To learn more about our industry partner programs through the GVU Center please contact us.

Keith Edwards | Director
GVU Center
Georgia Institute of Technology
keith@cc.gatech.edu
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