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1st Floor Demos

GT-RNOC Lab

Room 123

The Georgia Tech Research Network Operations Center (GT-RNOC) exists to accelerate innovation in networking, computing, mobility and convergence by enabling communities of collaboration. GT-RNOC provides, supports and maintains a unique end-to-end infrastructure within a realistic operational setting, accessible to world class students, researchers and innovators from various disciplines across the many Georgia Tech research centers.

GT-RNOC leverages the unique position of Georgia Tech as a pre-eminent network and network service hub in the state, the region and increasingly in the world. It provides researchers with access to this unique network infrastructure. It provides network administrators and service providers with an invaluable tool for developing and testing new management solutions in a cutting edge environment. Industry members of GT-RNOC include leaders in wireless, telecom, and cable, plus equipment, application, and content providers

Georgia Tech's Where Am I Service

Location – Room 123

Description: Georgia Tech's WhereAmI Service is a comprehensive Location Service incorporating multiple research and development efforts. The goal of WhereAmI is to facilitate research in the many aspects of location determination, location services and location-based applications.

Faculty: Russell J. Clark

Students: Ketaki Deo, Aneesh P. Tarun

Kino - Movie Widget

Location – Room 123

Description: A widget that demonstrates the convergence of different technologies utilizing IMS to enable collaboration. The theme for this widget is to use chatting and calling to help decision making in planning an event.

Faculty: Russell J. Clark

Students: Kedar N. Toraskar

Location Aware Mashups Using Zimlets

Location – Room 123

Description: Converging Third-Party Web Services with the Georgia Tech Mail client to provide location-aware and context-aware information.

Faculty: Russell J. Clark

Students: Aneesh P. Tarun

2nd Floor Demos

MUSIC TECHNOLOGY

GVU Café

Piano Etudes: Collaborative Composition on the Web

Location – GVU Cafe

Description: Piano Etudes combines a live concert performance with an interactive web site, using technology to break down the barriers between composers, performers, and listeners. Drawing from graph-based data structures and from the tradition of open-form musical scores, the project enables web visitors to create, share, and perform their own unique versions of short piano pieces.

Faculty: Jason Freeman

Students: Akito Van Troyer

ZooZBeat

Location – GVU Café

Description: ZooZBeat is a gesture-based musical studio, simple enough for non-musicians to immediately become musically expressive but rich enough for experienced musicians to push the envelope of mobile music creation. Start playing with just a click or select among background beats in a variety of styles. Use shake and tilt movements, tap the screen, or press the keypads to create and modify rhythmic and melodic lines. Based on years of research, our musical engine will interpret your actions into beautiful music that fits your style.

Faculty: Gil Weinberg

Students: Andrew Beck, Jagadeeswaren J.

LaDiDa

Location – GVU Café

LaDiDa is a "reverse karaoke" application for the iPhone. With LaDiDa, a user can sing into the phone, and it will analyze the singing and compose music to match the singer's voice. The core technology was developed at the Georgia Tech Music Intelligence Lab. A demo of LaDiDa can be heard at <http://khu.sh>.

Faculty: Parag Chordia

SYNAESTHETIC MEDIA LAB

Room 209

Synlab explores emerging modalities in new media. Our research focuses on tangible interaction and sensing technologies that support creative expression bridging the physical and digital worlds. Applications range across media arts, entertainment and educational domains. Website: www.synlab.gatech.edu.

Faculty Ali Mazalek (mazalek@gatech.edu)

Optical Chess

Location: Room 209

Description: Optical Chess is a board game that seeks to incorporate different game objectives into one cohesive, enjoyable game. The game's objectives are to be (a) easy to learn yet difficult to master, (b) based solely on strategy (no luck involved), and (c) to rely on emergent strategies that come from the core of the game. The result is Optical Chess, a laser-and-mirror based game that utilizes several concepts from the original strategy game, Chess. Like Chess, the player's objective is to successfully attack their opponent's King; and like Chess, the player does this by placing their opponent in "Check" to threaten them. There are numerous strategies to the game, and play-testing has shown that the game is very easy for beginners to pick up, yet still difficult for players to truly master. The game can be implemented in several different mediums - here, it is demonstrated using the Tangible Tracking Table, mimicking the behavior of lasers and mirrors using real pieces and mock lasers.

Faculty: Ellen Yi-Leun Do

Students: David Joyner, Andy Wu

emBodied Digital Creativity

Location – Room 209

Description: BDC examines the relationship between novel body movements and creativity. We are creating a system based on recent experimental evidence from cognitive science and neuroscience, showing that a common coding in the brain connects execution, perception and imagination of movements supported by NSF Creative IT.

<http://www.synlab.gatech.edu/projects/bdc/>

Faculty: Ali Mazalek, Michael Nitsche, Tim Welsh, Sanjay Chandrasekharan

Students: Paul Clifton, Friedrich Kirschner, Firaz Ahmed Peer, Andrew Quitmeyer

Puzzle Table

Location – Room 209

Description: In this research, we develop an interactive system named "Puzzle Table" to engage people playing a tangible puzzle game on the table surface. Each of the tangible puzzles is also a little surface with a digital content such as characters, objects, or scenes etc. projected on it. Through assembling or disassembling the tangible puzzle tiles, the users can change the digital contents to make their digital stories according to the different disposition and order of puzzle tiles. In other words, this system supports a dynamic story context. The consequence of puzzle game is no longer a single-track story. The system will generate diverse consequences based on subjects' will and activity such as order, preference, or random etc. Therefore, users can solve the puzzles in different ways to compose multiple-track stories.

Faculty: Ali Mazalek, mazalek@gatech.edu

Student(s): Yang Ting Shen, Firaz Ahmed Peer

KinoPuzzle

Location - Room 209

Description: KinoPuzzle draws on collage-making traditions to engage viewers in tabletop documentary stories using a combination of tangible pieces, digital images, video, and meta-data relationships.

Faculty: Ali Mazalek, mazalek@gatech.edu
Student(s): Susan Robinson, Andy Wu, Daniel Razza

WorkTop

Location - Room 209

Description: The WorkTop project aims to prove that multi-touch tabletop interfaces are appropriate for interdisciplinary collaboration on design tasks. We have designed a sketching application that takes in to account previous work on interface and design issues concerning collaboration around digital tabletops, which we will build and use to conduct user testing to determine whether a multi-touch tabletop application can be useful for workplace collaboration.

Faculty: Ali Mazalek, mazalek@gatech.edu; Claudia Winegarden; Jon Sanford

Student(s): Paul Clifton, Tina Lee, Natasha Powell

Tract

Location - Room 209

Description: Tabletop interfaces become easily filled with visual clutter when a number of objects are interacted with simultaneously. In Tract, we examine the use of data 'magnets' to organize the workspace."

Faculty: Ali Mazalek, mazalek@gatech.edu

Student: Meekal Bajaj

DIGITAL WORLD AND IMAGE GROUP

Room 209

Next Generation Play 2

Location – Room 209

Description: The Next Generation Game 2 deals with shared media experiences across multiple cell phones. It builds on the crossmedia application we built to connect TV and real objects to a media object database. Implemented on Android cellphones, it allows users to share media and activate it across multiple phone simultaneously. Supported by Alcatel Lucent.

<http://ngp.lcc.gatech.edu/>

Faculty: Janet Murray, Michael Nitsche

Students: Matthew Drake/ Sam Mendenhall

HappyMap

Location – Room 209

Description: Where do you find happiness? HappyMan is a mobile application, that allows you to keep up with the emotional states of your friends and it also tracks the changes of the emotional development in larger communities. See more at: <http://k2xl.info/happymap/>

Faculty: Michael Nitsche

Students: Daniel Miller, Daniel Stensland, Yoko

Betterhood

Location – Room 209

Description: Betterhood aims to revive neighborhoods into living communities. It encourages sharing of resources and services in an instantaneous and locative form of neighborhood newsletter running on Android phones. See more info at: <http://www.betterhood.com>

Faculty: Michael Nitsche

Students: John Douglass, Jacob Milam, Chris Morrell

COGNITIVE COMPUTING LAB

Room 222

Make Me Play Me

Location: Room 222

Description: A Game AI system that can be trained to play strategy games without knowledge of programming or artificial intelligence (AI). We will demo a gaming website where players create Mind Engines (or MEs) by demonstrating how to play a game, and play challenges against MEs made by other players. Applications range from new genres of games where the player can train companions or subordinates to achieve complex tasks in cooperation with the player, to games where the player plays the role of a coach, training a team of intelligent NPCs.

Faculty: Dr. Ashwin Ram, Dr. Santi Ontañón

Students: Jai Rad (MS-CS), Rushabh Shah (MS-CS), Kane Bonnette (MS-CS), Katie Long (BS-CS)

Cobot

Location: Room 222

Description: The internet is the #1 source of healthcare information for consumers. We will demo a system that consists of AI agents participating in an online community of health information seekers. These agents monitor user conversations in the community and provide personalized as well as community-based recommendations to users. This demo will showcase an innovative approach to delivering relevant health information using a combination of Web 2.0 social networking and Artificial Intelligence content analysis techniques

Faculty: Dr. Ashwin Ram

Students: Saurav Sahay (PhD-BINF), Anushree Venkatesh (MS-CS)

IMAGINE LAB

Room 222

Design Visualization

Location: Room 222

Description: Real-time visualization of architectural environments using game engine technologies. The Peachtree Corridor project, Georgia Tech 3D campus, and an example of an archeological site will be demonstrated.

Faculty: Tolek Lesniewski, Erik Palmquist

COMPUTATIONAL PERCEPTION LAB

Room 222

Augmenting Aerial Earth Maps with Dynamic Information **Location:** Room 222

Description: We introduce methods for augmenting aerial visualizations of Earth (from tools such as Google Earth or Microsoft Virtual Earth) with dynamic information obtained from videos. Our goal is to make Augmented Earth Maps that visualize the live broadcast of dynamic sceneries within a city. We propose different approaches to analyze videos of pedestrians and cars, under differing conditions and then augment Aerial Earth Maps (AEMs) with live and dynamic information. We also analyze natural phenomenon (clouds) and project information from these to the AEMs to add the visual reality. See more on the project page:

<http://www.cc.gatech.edu/cpl/projects/augearth/>

Faculty: Irfan Essa

Student: Kihwan Kim

BIZLAB

Room 222

The BizLab at Georgia Tech's College of Management brings together researchers across multiple business disciplines who study human behavior. Working at the convergence of economics and psychology, BizLab researchers use observational and experimental methodologies to examine such topics as information search, judgment and decision making, group behavior, information sharing and communication. <http://bizlab.gatech.edu/>

A Field Study of Smog Forecasting Teams

Location: Room 222

Description: Virtual teams are faced with increasingly large amounts of information which they must process to make time-critical decisions. Visualization technologies, with their ability to display large amounts of information in easily comprehensible formats, may offer special advantages to these teams. This case study examines the daily online discussions and forecasts of a virtual team to understand how team members make use of a portfolio of visual and non-visual information technologies to forecast air quality. We find that the team uses a greater percentage of visual than non-visual technologies when there is greater initial disagreement among team members. This effect is magnified on days when the consequences of making an incorrect forecast are more severe. The results suggest that, in addition to helping individuals make sense of complex data, information visualization can help virtual teams reach consensus.

Faculty: Nicholas Lurie, Sandra Slaughter

Student: Chi-Hung Peng

Marketing on the Map: Visual Search and Consumer Decision Making

Location: Room 222

Description: Although substantial research has been conducted on consumer search behavior in environments in which text information is acquired in a linear fashion, there has been little research on map-based search behavior by consumers. In a series of controlled lab experiments based on Google maps, we compare information search and choice behavior in text versus map environments and examine how the visual perspective (i.e., interactivity and depth of field) of map-based representations interact with contextual factors, such as the location of alternative choices relative to the consumer's current location, to affect information acquisition and decision quality.

Faculty: Nicholas Lurie

Students: Zoey Chen, Stephen He

Decision Making on the Small Screen: Adaptive Behavior in Constrained Information Environments

Location: Room 222

Description: Decision Making on the Small Screen: Adaptive Behavior in Constrained Information Environments Two process-tracing studies and a Monte-Carlo simulation examine how display characteristics of small screens affect decision making processes and outcomes. Experimental results show that users of small screens acquire less information, are less selective in information acquisition, and are more likely to process by attribute than by alternative. Decision quality is reduced on smaller screens and displays that show more attributes than alternatives lead to better decisions, regardless of screen orientation. Simulation results show that differences in the effort required to make decisions on small screen devices are much smaller for non-compensatory than compensatory decision strategies.

Faculty: Nicholas Lurie, Sri Narasimhan

Student: Tiger Song

Interactive Restructuring: Implications for Decision Processes and Outcomes

Location: Room 222

Description: To help consumers deal with increasing amounts of information, many online marketers offer tools that allow consumers to interactively restructure decision environments, such as the ability to sort on a particular attribute or eliminate particular alternatives. The authors propose that the use of restructuring tools changes consumers' decision processes but that effects on decision quality depend on choice context. Three experiments show that consumers are adaptive in their use of restructuring tools, engage in different decision processes in the presence of such tools, and change their decision strategies after using restructuring tools. The presence of sorting tools increases decision quality when attribute correlations are positive but not when attributes are negatively correlated. When attributes are negatively correlated, the ability to sort can lower decision quality when elimination tools are unavailable but increase decision quality when elimination tools are available. However, when attributes are positively correlated, the ability to sort improves decision quality regardless of the availability of elimination tools.

Faculty: Nicholas Lurie

Student: Amy Wen

TECHNOLOGIES AND INTERNATIONAL DEVELOPMENT

Room 223

Post-Conflict Computing

Location: Room 223

Description: Post-conflict reconstruction and development, and ensuring a lasting peace, is one of today's greatest and most pressing challenges in many areas. We are examining, and inventing, the role of computing and communications in post-conflict development. Working with Liberia's Truth and Reconciliation Commission we've developed a new interactive story-sharing systems to support understanding and healing. We've also studied the use of mobile phones throughout Liberia and the internet among the diaspora as tools for security, reconstruction and reconciliation. In new work we are designing virtual war memorials as lasting testaments to this civil conflict.

Faculty: Michael L. Best

Students: Thomas Smyth, John Etherton

Collaborative Knowledge Sharing

Location: Room 223

Description: Public access to information and communication technologies is often viewed as second-best when compared to individual private access. In the developing world, public access generally occurs due to scarcities of income, human capacities, and technological infrastructures. We hypothesize, however, contexts where public access is not a second-best substitute but a preferred condition. In these contexts the computer end-users share cognitive, social, technological and architectural affordances of these public spaces such that their ultimate experience is enhanced. We are examining and inventing systems that support the best forms of public access through survey and design work in laboratory settings at Tech and cybercafés in Ghana, West Africa. Ultimately our goal is to understand the states of end-user sharing in public facilities while also examining, and innovating upon potential designs, policies and architectures that support and enhance the best forms of end-user sharing.

Faculty: Michael L. Best

Students: Thomas Smyth, Issac Boateng

ICTs & Civic Participation: Towards the Nigerian National Election

Location: Room 223

Description: Towards the Nigerian National Election Information and communication technologies have been shown to be important tools to ensure free and fair elections across Africa. But most of this work has focused on the use of ICTs for activities such as poll monitoring or voter registration. We are interested in the use of ICTs to enhance civic participation and engagement more broadly in African elections. We have been designing social or user-created media technologies that support grass roots involvement in civic and electoral activities. Ultimately we intend to deploy this system to support the critical Nigerian election in 2011. We hope to test deploy the systems in Guinea's election in 2010.

Faculty: Michael L. Best

Student: Ayodeji Fajebe

DESIGN & INTELLIGENCE LAB

Room 223

ACT: Learning Models of Complex Systems in Middle School Science

Complex systems are everywhere in our world, and development of accurate mental models of complex systems is an integral part of learning science. While experts in science demonstrate a rich understanding of their domain's complex systems and their correspondent structures, behaviors and functions, novices express their understanding primarily in terms of the system's structure. The goal of our project is to facilitate learning about complex systems in terms of the interconnectedness of systems' structures, behaviors and functions. ACT (Aquarium Construction Toolkit) is an interactive learning environment, targeted toward middle school classes, that allows students to build conceptual models of aquaria in order to facilitate broader understanding of complex systems. Furthermore, ACT allows learns to demonstration their conceptual models in a simulative environment as a means of evaluating their models.

Faculty: Ashok Goel

Student: David Joyner

DANE: Design by Analogy to Nature Engine

Location: Room 223

Biologically inspired design (BID) is the practice of developing innovative technology inspired by ideas from nature. There are millions of species, each with many billions of years of field-testing (evolution), that contain unique and successful technological ideas that can help us innovate. However, practitioners of BID have some common complaints: they lack easy access to relevant biological information; the information they do have is unstructured, making discovery of underlying design principles in biology difficult; and information presented in the language of biology is difficult for designers and engineers to understand. DANE aims to address these issues by providing technological infrastructure that can be used to build and explore a large-scale, decentralized, biological knowledge base. DANE is designed to provide (a) knowledge sharing, so that innovators and biologists can add, incrementally improve, and browse information in the knowledge base, (b) a common language so that innovators and biologists can more easily collaborate and share cross-domain knowledge, and (c) representations of systems that draw attention to important mechanisms for more rapid understanding of underlying biological principles for application to innovative, new designs.

Faculty: Ashok Goel, Spencer Rugaber, and Jeannette Yen

Students: Swaroop Vattam, Michael Helms, and Bryan Wiltgen

Story Understanding in Investigative Analysis

Location: Room 223

The high-level task of investigative analysis is to construct a story that explains the connections among events in the input stream of data. STAB is a knowledge-based system designed to aid in investigative analysis. STAB represents crime patterns as hierarchical stories with goals and states. It generates multiple explanations for a data stream containing interleaved sequences of events, recognizes intent in a specific event sequence, and calculates confidence values for the generated hypotheses based on explanatory coverage. We view STAB as an automated cognitive assistant to human analysts: it may support investigative analysis by generating and managing

multiple competing hypotheses.

Faculty: Ashok Goel, John Stasko

Student: Adity Dokania, Avik Sinharoy

ENTERTAINMENT INTELLIGENCE LAB

Room 228

Entertainment Intelligence is the intersection of computer entertainment (e.g., computer games) and artificial intelligence. The goal of our research is to research and discover new computational algorithms and models that reason about how to make computer games, storytelling, and virtual worlds more engaging and entertaining.

Faculty contact: Mark Riedl (riedl@cc.gatech.edu)

Website: <http://www.cc.gatech.edu/~riedl/>

Intelligent Virtual Cinematography

Location: Room 228

Description: Virtual cinematography refers to the cinematic projection of scenes occurring in a 2D or 3D graphical environment onto a flat screen, with a virtual camera serving the role of a physical one. An intelligent virtual cinematography system uses artificial intelligence processes to automatically position a camera in the graphical environment in order to capture a scene in a meaningful way. We are developing systems that can automatically produce *machinima* – movies produced in graphical environments such as those provided by computer games – given a script, a virtual world, and a set of key cinematic knowledge.



Machinima Authoring Tools

Location: Room 228

Description: Machinima – movies produced in graphical environments such as those provided by computer games – is hard to create. We are researching human-computer interaction (HCI) and artificial intelligence (AI) techniques to assist human machinima creators with the production process. First, we provide an authoring interface based on intuitive metaphors to simplify the process of puppeteering avatars in a game environment. Second, we provide an AI-based “virtual audience” that provides constructive feedback with regard to story structure.

Automated Scenario Adaptation

Location: Room 228

Description: Computer games and game-based learning environments often make use of pre-scripted scenarios to present dramatic, educational, and training content. However, a one-size-fits-all scenario may not address all of the abilities, needs, or goals of a particular learner. An Automated Scenario Adaptor ‘re-writes’ the game scenario to better suit such requirements by adding or removing, or modifying events from a pre-existing scenario based on user profiles.

Mobile Alternate Reality Health Games

Location: Room 228

Description: Alternate reality games (ARGs) are interactive narratives that use the real world as a platform. An interactive narrative immerses a player in a storyline where the player is the protagonist. This project explores the use of mobile and GPS technologies to encourage healthy activity through games that can only be played outdoors, away from the computer.

ADAPTIVE DIGITAL MEDIA (ADAM) LAB

Room 228

Game Analytics

Location: Room 228

Description: Metric and analytic services have exploded online in recent years as everyone from the corporate CEO to the lone blogger wish to know more about how people interact with their online content. However, these services have focused solely on online spaces such as social networks, blogs and wikis. Game Analytics is an attempt to bring the practices of web analytics to the under analyzed area of online games. As part of the Adaptive Games project, we explore ways of capturing player behavior in games and how that information can be made valuable for game developers and players alike. We believe that through proper monitoring of player behavior across multiple game genres we can determine player motivations and ultimately deliver personalized content based on those motivations. This project is where game achievements, online visualizations, and artificial intelligence meet to analyze gameplay and create better game experiences. We have an initial seed grant from the National Science Foundation and our website is located at: <http://adaptivegames.lcc.gatech.edu/>

Faculty: Brian Magerko

Student: Ben Medler

Digital Improv

Location: Room 228

Description: The digital improv project is an investigation into the roots of human creativity as it relates to the development of artificial intelligence. We are exploring how to formalize techniques used in real-world interactive drama domains such as improvisational theater, through an examination of the cognitive functions of improv actors using the process of protocol analysis and behavioral coding. Such formalizations can better inform our design of story directors and synthetic characters for digital interactive drama systems. <http://adam.lcc.gatech.edu/>

Faculty: Brian Magerko, Celia Pearce, Mark Riedl

Students: Allan Baumer, Andrea Benavides, Alex Bullard, Michael Downing, Casey Fiesler, Daniel Fuller, Kurt Luther, Waleed Manzoul, Ben Medler, Beth Schechter

CONTEXTUAL COMPUTING GROUP

Room 243

Mobile Music Touch

Location: Room 243

Description: Mobile Music Touch is a system designed to passively teach people how to play musical instruments, while they're doing other tasks such as working at their desk or reading on a long commute. The system consists of two parts: 1) a lightweight, wireless, tactile glove with a vibration motor for each finger, and 2) a mobile device such as MP3 player or cell phone. As the music is played on the MP3 player, the synced tactile glove vibrates the corresponding fingers in charge of playing the notes. Thus, a user can hear the music and feel it playing on their hands. A user can use this system to automatically rehearse piano, trumpet, sax, etc songs while going about their daily routines.

Faculty: Thad Starner

Students: Tanya Markow, Kevin Huang

TTYPhone

Location: Room 243

Description: TTYPhone emulates a teletypewriter on a cell phone providing deaf users with direct and easy access to emergency services. Deaf users can dial 911 from a cell phone and communicate with the 911 operator through an Instant Messaging style interface. The software TTY then encodes the text as TTY signals and sends it over the voice channel. Incoming TTY signals are decoded and displayed as text.

Faculty: Thad Starner

Student: Nirmal Patel, Ketaki Deo

SmartSign Alert/Express

Location: Room 243

Description: This project involves the development and evaluation of a mobile content delivery system. Using small, unplanned moments throughout the day, we will endeavor to increase participants knowledge of American Sign Language vocabulary. This project also involves efforts assess the efficacy of content delivery to mobile phones and traditional, desktop-based systems.

Faculty: Thad Starner

Student: Kim Weaver

Telesign

Location: Room 243

Description: This project involves the design and evaluation of a mobile ASL phrase book to help Deaf individuals communicate with hearing individuals when performing tasks such as hunting for an apartment or taking a pet to the vet.

Faculty: Thad Starner

Student: Kim Weaver

Child's Play

Location: Room 243

Description: The Child's Play project focuses on the design of technological tools to help increase the understanding of children's development through the exploration of toddler-object interaction. Specifically, this project embeds wireless sensors into children's toys to allow automatic recognition of different types of play behaviors allowing for potential characterizations of the child's developmental progress and retrospective analysis

Faculty: Thad Starner

Student: Tracy Westyn

CopyCat

Location: Room 243

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

Faculty: Thad Starner

Students: Zahoor Zafrulla, Kim Weaver

MAGIC

Location: Room 243

Description: Imagine controlling your phone or your iPod with just a wave of your hand! MAGIC is a tool for creating such motion gesture-based interfaces. It allows a designer to create and test gestures, and helps them to make sure that normal motions like waving to a friend won't accidentally tell your phone to call your grandmother!

Faculty: Thad Starner

Student: Daniel Ashbrook

Dancing in the Streets

Location: Room 243

Description: Dancing in the Streets is a version of Dance Dance Revolution that runs on a cellular phone - instead of pressing buttons on the phone to play the game, it employs Bluetooth accelerometers placed on the feet. The user can then dance along with the songs similar to how it is played on the traditional Wii game system, providing some form of exercise. This project seeks to determine if this is an engaging way to have students get some type of physical activity during the day.

Faculty: Thad Starner

Student: Scott Gilliland

BrainSign

Location: Room 243

Description: The problem of classifying complex motor activities from brain imaging is relatively new territory within the fields of neuroscience and brain-computer interfaces. We report positive sign language classification results using a tournament of pairwise support vector machine classifiers for a set of 6 executed signs and also for a set of 6 imagined signs. For a set of 3 contrasted pairs of signs, executed sign and imagined sign classification accuracies were highly significant at 96.7% and 73.3% respectively. Multiclass classification results also were highly significant at 66.7% for executed sign and 50% for imagined sign. These results lay the groundwork for a brain-computer interface based on imagined sign language, with the potential to enable communication in the nearly 200,000 individuals that develop progressive muscular diseases each year.

Faculty: Thad Starner

Student: Nishant Mehta

Mobile Text Entry and Automatic Whiteout

Location: Room 243

Description: By analyzing features of users' typing, Automatic Whiteout++ detects and corrects up to 32.37% of the errors made by typists while using a mini-QWERTY (RIM Blackberry style) keyboard. The system targets "off-by-one" errors where the user accidentally presses a key adjacent to the one intended. Using a database of typing from longitudinal tests on two different keyboards in a variety of contexts, we show that the system generalizes well across users, model of keyboard, user expertise, and keyboard visibility conditions. Since a goal of Automatic Whiteout++ is to embed it in the firmware of mini-QWERTY keyboards, it does not rely on a dictionary. This feature enables the system to correct errors mid-word instead of applying a correction after the word has been typed. Though we do not use a dictionary, we do examine the effect of varying levels of language context in the system's ability to detect and correct erroneous keypresses.

Faculty: Thad Starner

Student: James Clawson

DIRECT BRAIN INTERFACES – GT BRAINLAB

Room 243

The mission of the GT BrainLab is to pioneer dramatically new paradigms for human-computer interaction by exploring the potential of biometric and direct brain inputs for communication and control. BrainLab technologies aim to improve the quality of life for people with severe motor disabilities, and to explore possibilities for mainstream applications for biometric technologies. Demos and posters will include:

The Aware Chair

Location – Room 243

Description: In order to incorporate an intelligent, context-aware communication, environmental control, and navigation system that learns its users' preferences and habits in order to predict selections. The goal of the Aware Chair research is to make brain signal control faster, easier, and more accurate for people with severe physical disabilities. A new heads-up display based on visual brain signals is the basis of our latest study.
Faculty: Melody Moore, melody@cc.gatech.edu

Neural Internet

Location – Room 243

Description: Access to the internet can be life-changing for people with severe disabilities. The BrainBrowser allows neural control of web surfing, including following hyperlinks and web controls.

Faculty: Melody Moore, melody@cc.gatech.edu

Student: Jeremy Johnson

BrainSign: Brain Gesture Recognition**Location** – Room 243

Description - This new study is exploring composite patterns of brain signals in order to determine if gesture languages such as American Sign Language can be recognized with MRI and EEG brain imaging.

Faculty: Melody Moore, melody@cc.gatech.edu, Thad Starner

Functional Near Infrared Imaging for Communication**Location** – Room 243

Description: The Kokoro Gatari is a simple, portable brain imaging device based on fNIR technology. It can allow people with very severe physical disabilities, such as locked-in syndrome, to communicate. We are currently conducting a large study with ALS patients to determine the effectiveness of this device.

Faculty: Melody Moore, melody@cc.gatech.edu

Student: Ian McClendon

Stroke Rehabilitation and Neural Plasticity**Location** – Room 243

Description: A collaboration with GT Applied Physiology and BioEngineering is exploring the possibilities of incorporating direct brain interfaces with rehabilitation robots to provide treatment options for people with severe paralysis resulting from strokes

Faculty: Melody Moore, melody@cc.gatech.edu

3rd Floor Demos

SONIFICATION LAB

Room 322

Auditory Graph Design, Context Cues, and Individual Differences **Location:** Room 322

Description: Creating a (visual) graph without axes, tick marks, or labels will generally earn you an 'F' in high school math class. After all, it is just a squiggle on a page without the added context that those things provide. Auditory graphs require the same elements, so we are studying how best to create them, introduce them into an auditory graph, and examine how people learn to use them for better (auditory) graph comprehension. At the same time, every person hears things slightly differently. Our work in individual differences in auditory display comprehension examines such questions as: i) How can we determine, in advance, what differences will have an effect (if any) in the perception and comprehension of auditory graphs and sonification? ii) What are the characteristics of the listener that predict performance? We are studying a range of factors, including perception, cognition, and listening experience. One major factor we are considering is whether a listener is sighted or blind, and if blind, at what age blindness occurred. Web: <http://sonify.psych.gatech.edu/research/index.html>

Faculty: Bruce Walker, bruce.walker@psych.gatech.edu

Student(s): Michael Nees, Lisa Mauney

The Sonification Sandbox: Auditory Graphing Software **Location:** Room 322

Description: We have developed a sophisticated, flexible software platform that can turn data into an auditory graph. This Java-based system includes a spreadsheet for manipulating the numbers, and produces visual graphs, auditory graphs, and a range of multimodal combinations. The graphs can be played within the program, saved in a special lightweight file format for sharing or editing later, or exported to image, sound, or movie files. We have evaluated the usability and accessibility of the Sonification Sandbox, and we are now working with public school students and teachers to study its utility for teaching math and science. We are also working on versions of the software that run on mobile devices and on the web (think, Google Charts). Web: <http://sonify.psych.gatech.edu/research/index.html>

Faculty: Bruce Walker, bruce.walker@psych.gatech.edu

Student(s): Ben Davison, Anya Kogan, Lisa Mauney

Advanced Auditory Menus: Non-visual User Interfaces for Mobile Devices

Location: Room 322

Description: Spoken menus can be dramatically improved with the careful addition of different types of non-speech sounds. Such enhancement sounds have the potential to convey contextual information and feedback while a user navigates more quickly and effectively through the menu

of an electronic device. We have developed desktop and mobile demos, in Flash, Java, and Symbian. We will highlight auditory scroll bars and spearcons (brief sound cues created by speeding up the original text-to-speech sound file in a novel way).

Web: <http://sonify.psych.gatech.edu/research/index.html>

Faculty: Bruce Walker, (404) 894-8265, bruce.walker@psych.gatech.edu

Student(s): Anya Kogan, Unkyong Lee, Siddharth Gupta, Ben Davison, Myounghoon Jeon

The SWAN Project

Location: Room 322

Description: The SWAN Project is an NSF funded collaboration between Professors Bruce Walker (Psychology and Computing) and Frank Dellaert (Computing) to develop a system to help people with low vision navigate from place to place, while being aware of features of the surrounding environment, such as stairs, signs, offices, shops, curbs, and so on. We use sensor fusion to combine computer vision with GPS, maps, and other sensors, then produce a set of auditory cues to guide and inform the user. We are extending this work to astronauts, factory workers, and tactical situations. Web: <http://sonify.psych.gatech.edu/research/swan/index.html>

Faculty: Bruce Walker, bruce.walker@psych.gatech.edu; Frank Dellaert, dellaert@cc.gatech.edu

Student(s): Jeff Lindsay, Jeff Wilson, Sangmin Oh

The Accessible Aquarium Project

Location: Outside of Room 322

Description: Museums, science centers, zoos and aquaria are faced with educating and entertaining an increasingly diverse visitor population with varying physical and sensory needs. In an effort to make such "informal learning environments" more accessible to visually impaired visitors, the Georgia Tech Accessible Aquarium Project is developing auditory display and sonification methods for use in exhibit interpretation. Our project uses advanced computer vision techniques to track the fish (and other creatures), then uses the movement data to create meaningful and aesthetic music. The music is then presented to a visitor via a mobile audio device, which allows them to interact with the music options, further enhancing their learning and enjoyment. This project is a collaboration between Psychology, Interactive Computing, CATEA, and Music. Web: <http://www.accessibleaquarium.org>

Faculty: Bruce Walker, bruce.walker@psych.gatech.edu; Tucker Balch, tucker.balch@cc.gatech.edu; Gil Weinberg, gilw@gatech.edu.

Student(s): Jin Han Lee, Sriram Viswanathan, Ruchir Gupta

"Bonephones": Bone Conduction Audio Research

Location: Room 322

Description: We are investigating the use of bone-conduction headsets in auditory displays. This merits many different investigations into the perceptual qualities of listening through bone conduction. This includes thresholds, spatial audio abilities, reaction times, and speech intelligibility. Web: <http://sonify.psych.gatech.edu/research/bonephones/index.html>

Faculty: Bruce Walker, (404) 894-8265, bruce.walker@psych.gatech.edu
Student(s): Raymond Stanley, Naomi Warnick

EVERYDAY COMPUTING LAB

Hallway 323

Saludi!: A Platform for Health and Wellness Self-Management

Location: Hallway 323

Description: Acquiring and maintaining a healthy lifestyle usually requires an individual to develop a set of personalized routines and strategies for managing everyday decisions and activities--what to eat, when to exercise, how to manage stress, etc. Strategies for developing such self-management skills are often taught to patients with chronic illnesses, such as diabetes or high blood pressure, who must also manage their everyday activities in light of their condition. We are using insights from research in clinical health self-management to develop a system for supporting healthy behavior change.

Our system, Salud! allows users to track and analyze their own metrics of health and wellness, and how these change over time in response to changes in behavior or other factors. We are currently evaluating this system to understand its effect on users selection of personal health goals, motivation to achieve these goals, and effectiveness in doing so.

Faculty: Elizabeth Mynatt

Student(s): Yevgeniy Medynskiy, Ruchi Goswami, Akshit Proothi, Aparna Raman, Catherine Grevet, Dev Priya, Mebaa Kidane, Nabanita Ghosal, Vasudhara Kantroo, Zack Brunson"

Dr. J Says...

Location: Hallway 323

Description: Dr. J Says... is a web based application that makes real-life meal recommendations to its users from the restaurant of their choice based on their health and taste profiles. It represents a class of tools that use information and communication technologies to translate complex medical guidelines into contextually relevant medical advice. The Dr. J Says... research project is studying the impact of such personalized, pervasive and real-life advice on patient compliance in the area of diet related chronic diseases.

Faculty: Elizabeth Mynatt

Student: Jiten Chhabra MD

American Horsepower Challenge**Location:** Hallway 323

Description: American Horsepower Challenge is a game created by Humana Innovations to encourage middle school kids to be more physically active. The GVV Center and Humana are collaborating to evaluate how effective the game is and how well the kids enjoy it.

Faculty: Beth Mynatt, Richard Catrambone
Students: Erika Poole, Elsa Eiriksdottir, Yan Xu

Social Media for Healthy Kids**Location:** Hallway 323

Description: The rise in childhood obesity and early-onset diabetes indicate the need for children to take a more active role in managing their health; children who internalize healthy eating and exercise habits will be healthier into adulthood. Such identity formation is difficult to teach, and material introduced in the classroom but separated from the rest of kids' lives may fail to take hold. We are looking at ways in which social media, such as social networking sites and virtual worlds, can allow children to articulate their own identities as healthy people both in and out of school. We are currently in the early planning stages of a social media intervention for elementary schools which will help us examine these issues in more depth.

Research Partners: Georgia Tech Research Institute, Children's Healthcare of Atlanta

Faculty: Elizabeth Mynatt

Student: Andrew Miller

PIXI LAB**Hallway 323****Atlanta CRM****Location:** Hallway 323

Description: Atlanta CRM is a system that helps case workers communicate with their homeless clients. It provides a simple interface to create, schedule, and manage messages sent to client's mobile phones. In turn, the homeless can leave voice messages or send text messages to their case manager to help keep them in touch with the resources they need as they go about their day.

Faculty: Keith Edwards

Student: Christopher LeDantec

CONTEXTUALIZED SUPPORT FOR LEARNING**Room 323****Georgia Computes!****Location:** Room 323

Description: Georgia Computes! is an NSF "Broadening Participation in Computing" alliance focused on increasing the number and diversity of computing students in the state of Georgia. The goal of this effort is to improve the computing education pipeline across the state of Georgia. Some of our outreach efforts include attracting girls into computing with activities in camps and after school programs with our partners, the Girl Scout Council of Northwest Georgia

and the YWCA of Georgia, offering summer camps to middle and high school students, teaching high school educators how to teach computing using motivating examples, and offering workshops to University System of Georgia computing faculty on new approaches to motivate computing education.

Faculty: Mark Guzdial, Amy Bruckman, Barabara Ericson

Student(s): Jill Dimond, Michael Hewner, Lijun Ni

Computer Science Education for End-User Programmers

Location: Room 323

Description: Recent estimates for the number of end-user programmers indicate this population is over four times larger than the community of professional programmers. Native scripting capabilities have now become integrated with media manipulation tools like Photoshop, Final Cut Pro, and Blender. Such new support for end-user programming creates many opportunities for researchers. This research is an effort to enable us to gain a deeper understanding of how and why media professionals, like graphic designers, learn to script. Specifically, we are interested in what they know about Computer Science, how they learned it, and how we might support newcomers in learning Computer Science content informally.

Faculty: Mark Guzdial, guzdial@cc.gatech.edu

Student: Brian Dorn

Designing Online Communities

Location: Room 323

Description: GaComputes is an NSF Broadening Participation in Computing focused on increasing the number and diversity of computing students in the state of Georgia. We are studying youths' perceptions of computing: what is computing? What are careers in computing? how does computing relate to the tools, gadgets, and online websites that youth use for fun in their daily lives? Our goal is to better understand what kids do for fun with technology and develop interventions to encourage them to consider degrees and careers in computing.

Faculty: Mark Guzdial

Student: Sarita Yardi

Game Testers to Technologist

Location: Room 323

Description: African American males play video games more often than any other group. Yet African Americans have dismal representation in the games industry and their interest in video games is not leading them in to computer science fields. We believe there are many social and cultural factors that influence the transfer of interest and skills developed through video games to academic and employment success. To address these factors we are developing a game tester

job-training program. Game testing is sometimes considered an entry point for careers in the games industry. But more than just careers in gaming, by developing game testing skills participants will look under-the-hood of the games, seeing the structure of digital media, learning vocabulary, and understanding basic job skills and the value of their opinion in the field of computer science.

Faculty: Mark Guzdial

Student: Betsy James DiSalvo

Crafting Kids Into Computing (PicoCrickets)

Location: Room 323

Description: We use PicoCrickets to introduce computing in a way that challenges kid's stereotype of computing. Kids create a musical pickle, time their reactions to sound and light, create a kinetic sculpture, and more by doing drag-and-drop programming. We are getting statistically significant positive changes in the student's attitudes towards computing with these activities in just four hour workshops.

Faculty: Mark Guzdial and Barb Ericson

Driving Kids Into Computing (LEGO NXT Robots)

Location: Room 323

Description: We use LEGO robots to introduce computing in a hands-on and concrete way. We have students learn about problem solving and simple sequential programming by having them program the robots to go through a course outlined on the floor. We have them learn about repetition and creating reusable methods by having them program a 30 second dance. We teach about conditionals by having the students program the robots to follow a black line on a white background.

Faculty: Mark Guzdial and Barb Ericson

Animating Kids Into Computing (Scratch)

Location: Room 323

Description: We use Scratch to introduce computing concepts by having kids use drag-and-drop programming to create 2D animations and games. Scratch integrates sounds and images. Kids can share their Scratch creations on the Scratch website. Scratch also allows kids to create their own images.

Faculty: Mark Guzdial and Barb Ericson

Directing Kids Into Computing (Alice)

Location: Room 323

Description: We use Alice to introduce computing concepts by having kids use drag-and-drop programming to create 3D movies and games. Kids like directing their own movies. Alice has a large selection of 3D models that the kids can control.

Faculty: Mark Guzdial and Barb Ericson

ELECTRONIC LEARNING COMMUNITIES LAB

Room 326

Science Online: Knowledge Building in Wikis

Location: Room 326

Description: What do people learn from writing on Wikipedia? How do young people learn to be smart about where information comes from? Science Online is a wiki-based learning environment where student authors construct articles about science topics. The site runs on the same software as Wikipedia, but with special extensions that support careful citation. By participating in the construction of a science resource for the public, students have a unique opportunity to reflect on where scientific information comes from and to engage with issues of epistemology and values in science.

Faculty: Amy Bruckman

Student: Andrea Forte

Leadership and Collaboration in Online Animation Communities

Location: Room 326

Description: How do people with different skills and from different countries collaborate over the Internet to produce high-quality animated movies? To find out, we interviewed 31 animators from five 2D and 3D online animation communities and analyzed over 900 forum threads to identify patterns and trends. We found that project leaders are heavily burdened and lack adequate technological support to help them design, manage, and complete successful collaborative projects. As a result, most of these projects fail. Based on our findings, we are designing a Web-based software tool to deploy in online animation communities. One mode will support existing practices by scaffolding strong leadership and planning. Another will transform existing practices by facilitating decentralized leadership and improvisation. We plan to compare and contrast the processes and products generated by users of both modes to elicit broader principles of online creative collaboration.

Faculty: Amy Bruckman

Student: Kurt Luther

Teens as Designers of Social Networks

Location: Room 326

Description: We are developing a site to teach teens how to design their own online social networks. The goal of our research is to broaden participation in computing and to examine social learning as an approach for influencing and evaluating participation in online social networks. What happens when teens create, administer, and moderate their own social networking sites? What kinds of communities are formed and what patterns of participation emerge? Through a series of design studies, this thesis investigates ways of motivating a broader demographic of teens as designers on the web.

Faculty: Amy Bruckman

Student: Sarita Yardi

Glitch Game Testers

Location: Room 326

Description: Low-income African American teenage boys typically play console video games with passion. In our fieldwork to date, we have found that many are particularly fond of sports video games. As they play, they dream of being sports stars like Randy Moss or LeBron James. However, they typically don't embrace another dream: the dream of making their own video games or becoming technical professionals. In this project, we seek to leverage their love of video games to encourage their participation in computing education and introduce them to the idea of pursuing technical careers. We hope to accomplish this by offering these youth a contextualized computing curriculum focused on games and game testing. We will be able to provide these teens with an authentic experience: testing beta versions of real games under development for real game companies. We propose this not as an apprenticeship for future work as game testers, but as an introduction to the game industry, and a way to look inside the black box of video games to see the power of computation in their lives.

Faculty: Amy Bruckman

Student: Betsy James DiSalvo

WORK2PLAY LAB

Room 326

Sun Dial: Exploring Techno-Spiritual Design Through A Mobile Islamic Call To Prayer Application

Description: Sun Dial is a mobile phone application that supports Muslims' prayer practices. Our projects responds to the growing interest in knowing how to appropriately design technologies that account for and support user's spiritual and religious practices. Unlike similar systems ours relies on imagery, rather than text and graphs to communicate prayer times. The sun's gentle movement through the sky prompts Muslim users to their five daily prayer times. Users' drove this choice, by telling us that tracking the sun was the most religiously valued method to determine prayer times. Additionally, our system was developed for Muslims practicing in the United States, who told us that they have different needs from those living in regions where Islam is more widely practiced. Sun Dial will soon be available as an iPhone application.

Faculty: Beki Grinter

Students: Susan Wyche, Benjamin Davison, Kelly Caine, Hafez Rouzati

Kermit: A Visual Home Network Tool

Location: Room 326

Description: Ever wonder who's surfing on your wireless internet connection at home? Or why the internet seems to be slowing down when you're trying to watch that YouTube video? Our formative studies of home networking showed that people often do not understand how their home networks are being used in real time or what resources the network requires (such as time,

bandwidth and even power). Kermit is a visual tool to show you more information about your home network and to help you determine why the internet is slowing down in your home. Kermit shows you who's online in your house, what they're doing and let's you limit access to certain internet services to help you speed up that frustrating connection. Come find out more about Kermit's design and see a demo. Through Kermit's evaluation, we will see how to design future home networking tools and understand how showing you who's hogging the bandwidth in your home, for example, changes household dynamics.

Faculty: Beki Grinter, beki@cc.gatech.edu

Student(s): Marshini Chetty marshini@cc.gatech.edu, www.cc.gatech.edu/~marshini

**Culturally-Relevant Technologies
for Encouraging Healthy Eating Practices**

Location: Room 326

Description: Our research focuses on designing systems that encourage healthy eating in specific cultural contexts. In particular, we are examining how eating practices are socially and culturally influenced within low-income African American communities. We are motivated by the fact that this segment of the population experiences a disproportionate amount of diet-related health problems. We will demo EatWell, a cell phone application that allows individuals to record and share audio memories of how they have tried to eat healthfully with others in their neighborhoods. In addition, we will overview a mobile game that we are currently developing. This game, OrderUP!, helps people learn strategies for eating healthfully in a lightweight and fun way.

Faculty: Beki Grinter, beki@cc.gatech.edu

Student: Andrea Grimes, agrimes@cc.gatech.edu

COMPUTER GRAPHICS

Room 321

Animating Physics for Motion Pictures and Video Games

Location – Room 317

Description: Artists who create motion pictures and video games often simulate physics to produce a variety of special effects. We display several results of simulated physics in order to make motion-picture-quality animations. Specifically, we animate gooey, viscoplastic materials like slime and putty, we simulate erosion and corrosion due to acid as it eats through metal, and we use state of the art optimization techniques in order to control simulated clothing on animated characters.

Faculty: Greg Turk

Students: Chris Wojtan

Interactive Synthesis of Human Object Interaction

Location – Room 325

Description: We present an interactive motion editing tool for creating dynamic scenes with human and object interaction. Our approach solves for an optimal control problem that leverages

methods for physics-based rigid body control and kinematics-based human motion editing. Because the humans and the objects are coupled via physical contacts, our interface allows the animator to directly change the trajectories of the human or objects and simultaneously render the effect of the edits on the entire scene. Consequently, the animator can efficiently create complex interaction that requires precise synchronization, such as juggling. Our framework is generic to the choice of human motion editing method, as long as the differential information of the motion can be computed.

Faculty: Karen Liu

Students: Sumit Jain

**Animating Responsive Characters with
Dynamic Constraints in Near-Unactuated
Coordinates**

Location – Room 325

Description: This project presents a technique to enhance a kinematically controlled virtual character with a generic class of dynamic responses to small perturbations. Given an input motion sequence, our technique can synthesize reactive motion to arbitrary external forces with a specific style customized to the input motion. We demonstrate the simplicity and robustness of our technique by showing a variety of examples.

Faculty: Karen Liu

Students: Yuting Ye

INTERACTIVE MEDIA TECHNOLOGY CENTER

Room 309

IMTC is a sister center to GVVU co-located on the third floor of TSRB. IMTC undertakes research and development projects in areas similar to GVVU, with a more commercial, short-term focus. We collaborate closely with GVVU on a number of projects. IMTC is pleased to present some demos of IMTC/GVVU collaborative projects as well as a sampling of other work.

DARPA ASSIST (Advanced Soldier Sensor Information Systems Technology)

Location – Room 309

Description: ASSIST is a hardware and software solution that helps soldiers on patrol gather information, generate intelligence, create reports on the spot in the field, and share intelligence in real-time with other soldiers in the field and back at the base. We will be showing a prototype hardware capture platform, as well as ASISSTView, a visual tool to rapidly search data, find events of interest, and generate reports.

Faculty: Ed Price, Peter Presti, Jeremy Johnson, Thad Starner

Students: Tracy Westyn, David Minnen, Dan Ashbrook, Chris Howse, Nirmal Patel

Millennium Gate

Location – Room 309

Description: The Millennium gate is a 73 foot high Monumental Arch being built in Atlantic Station in midtown Atlanta, the largest brownfield redevelopment site in the US. IMTC is developing interactive visitor technology for inclusion in the museum in the base of the gate, showcasing the history of Atlanta and the influence of philanthropy on the development of Atlanta and the other great cities in the US. A prototype of the system will be on display. The Gate opens in Spring 2008.

Faculty: Brian Jones, Scott Robertson, Tiffany O'Quinn, Maribeth Gandy, Peter Presti, Jeff Wilson

Others: Althea Brown, Nadia Christie

D-MATTER

Room 309

Sympathetic Devices

Location – Room 309

Sympathetic Devices is a project focused on designing communication devices for aging individuals across all levels of housing options in order to help these individuals maintain personal and social connections in their lifestyles. The overarching goal of the project is to address social isolation and depression by first understanding how individuals currently socialize and internalize during everyday activities, then designing devices to help them develop social relationships and support groups, as well as manage personal goals. Of significant importance is the aesthetics of design, ease of use and overall usefulness of the devices. This research is funded through a joint seed grant awarded by GVVU Center and the Health Systems Institute at Georgia Tech.

Faculty: Claudia Winegarden, Brian D. Jones

Students: Marc Lawson, Jenna Schmidt, Josh Tuminella, Jae Wook Yoo, Tara Davis, Shabnam Ghaffari, Brian Holcombe, Nibha Jain, Srikanth Jalasutram, Gourab Kar, Dale Kim, Gabriel Landes, Karen MacKay, Jefferson McCloud, Wen Hong Neoh, Natasha Powell, Wassa Rattana-Panont, Indushree Thumsi, Benjamin Walker, Jasmine Williams

UBIQUITOUS COMPUTING LAB

Room 330

Viz-A-Vis: Visualizing Activity Through Vision

Location: Room 330

Description: We present Viz-A-Vis, Visualizing Activity through Vision. We deploy overhead cameras in everyday environments, record video, process the video and visualize activity.

Faculty: Gregory Abowd

Student: Mario Romero

Domestic Energy Displays: An Empirical Investigation

Location: Room 330

Description: We conducted two studies to explore how domestic energy information displays relate to a consumer's energy awareness and behavior. First, we investigated the impact of a simple energy feedback system, both stationary and portable versions, on household energy awareness and consumption. We deployed the system in eight homes for three weeks each, providing half of the participants with a portable version and the others with a stationary one. We collected an account of each user's experience. Second, we investigated how energy awareness interacts with the level of spatial and temporal information in an energy display in a more controlled manner with fifty-nine participants in both the USA and South Korea. Our findings from two studies reveal how properties of energy information displays encourage investigation of energy consumption patterns in the home.

Faculty: Gregory D. Abowd

Student: Tae-Jung Yun, Hee Young Jeong, Peter Kinnaird

Daily Talks: Short Message Service for Children on Asthma Management

Location: Room 330

Description: Asthma is a complex disorder characterized by variable and recurring symptoms, and leading chronic illness in children. It is a heterogeneous condition with triggers that vary between patients. Targeted interventions to alleviate the problem of asthma morbidity among low-income children are reducing differences in childhood asthma hospitalization and morbidity. However, every child with asthma cannot access the program due to the limited resource. SMS is one of candidates for low-income population. The goal of study is to investigate two-way SMS technology on asthma management between patients and physicians. 1) SMS is an effective technology instrument to engage patients in their everyday activities. 2) None of the studies look at the role of the physician. We need to engage the physician and provide a responsibility to monitor patient progress between office visits. 3) It is also important to provide Web interfaces, particularly to the physician, which will allow a rich set of clinically relevant activities. 4) The Web interface can also provide a variety of ways for the physician to interact with the patient. 5) Much of the value of the information gathered is in being able to visualize and analyze trends in patient response. Based on requirements and capabilities, we are building SMS technology on asthma management. Outcome measures of interest shall include locus of control, patient medication adherence, patient clinical indices, and disease improvement. Furthermore, we believe our intervention will force physician asthma management adherence toward dynamic disease events.

Faculty: Rosa Arriaga, Gregory D. Abowd

Students: Tae-Jung Yun, Hee Young Jeong, Adebola Osuntogun, Sumit H Savla

ContextMe

Location: Room 330

Description: Children with autism frequently engage in stereotypical repetitive behavior such as hand flapping, clapping, body spinning or rocking, echolalia, lining up or spinning objects. Being aware of child's external environment as well as physical and physiological characteristics will allow parents and other caregivers to better understand causes and make interventions more effective. ContextMe project will provide a mechanism to capture context from sensors embedded in the environment, namely cameras and microphones and map it with data collected from on-body sensors like accelerometers to capture motion and heart rate monitors for bio-feedback.

Faculty: Gregory D. Abowd

Student: Nazneen Anwer

Connect 2 Congress: Visual Analytics for Civic Oversight

Location: Room 330

Connect 2 Congress is a publicly accessible, interactive visual exploration tool which provides information regarding the United States Congress person's legislative behaviors. Users can uncover unexpected patterns in behavior and gain insight into how their representatives are governing.

Faculty: Gregory Abowd

Students: Peter Kinnaird, Mario Romer

Cold Probe Testing Tool for Autism Center

Location: Room 330

Cold probe test is for specialist to know about the progress of children. But in current setting, it is hard for specialist to collect the data and transform it into digital format. Easy Cold Probe Tools (ECPT) that uses digital pen to collect the data, and transforms data into digital format with some visualization capability is proposed in this demo. The system is now deployed in some autism center for further research.

Faculty: Gregory Abowd, Rosa Arriaga

Students: Rongheng Lin

Refl-ex

Location: Room 330

Description: Deficits in social skills and executive function (the control of one's thought processes) are generally considered the defining characteristics of Asperger Syndrome and High-Functioning Autism. Refl-ex is a social problem-solving game that addresses both of these areas, based upon a constant loop of experience and reflection activities. The user will experience a social scenario in which they must make a series of decisions in order to overcome unexpected obstacles and successfully navigate the social situation. The user then reflects on the experience by recreating it using interactive puzzle pieces.

Faculty: Gregory Abowd, Rosa Arriaga

Students: Fatima Boujarwah, Hwajung Hong

AR/Presence

Location: Room 333

Description: Presence is a concept currently used in the VR community to evaluate the quality and effectiveness of virtual environments. Presence is defined as the “sense of being there” or, more appropriate for our purposes, “a perceptual illusion of non-mediation”. In this project, we are investigating presence for use in AR evaluation. In this first phase we are exploring what this concept means in a mixed reality setting, how existing measurement techniques such as questionnaires and physiological sensing can be applied to AR applications, and whether existing data regarding immersion factors and presence translate to the AR domain. Our first experiment recreates the virtual “pit” experiment done at UNC in AR with the goal of producing similar physiological effects on the study participants. The overall goal of this work is to generate evaluation techniques for AR as well as to begin defining design and usability guidelines for the creation of effective AR experiences.

Faculty: Maribeth Gandy, Blair MacIntyre, Richard Catrambone, Jay Bolter

Student: Chris Alvarez

Contact: maribeth.gandy@imtc.gatech.edu

AR Scratch

Location: Room 333

Description: This project explores how augmented-reality technology can be presented to young programmers. MIT's Scratch environment allows children to create 2D animations and games through simple drag and drop programming. AR Scratch extends this authoring environment, permitting digital creations to be mixed with real-life objects. Through interaction with physical objects, children can influence the behavior of actors in their programs that now inhabit 3D real-world spaces. The general intent of the work is to explore how interaction metaphors can be used to match authors' cognitive abilities to the capabilities of this technology.

Faculty: Blair MacIntyre

Student: Iulian Radu

Contact: Iulian Radu infinite.flow@gmail.com

Handheld Augmented Reality Games

Location: Room 333

Description: In this project, we are exploring how to create augmented reality games using handheld devices, such as mobile phones, PDAs or handheld game consoles. We are particularly interested in multi-player games that combine the power of computer games (i.e., continuous simulation and gameplay) with the social aspects of board and card games (i.e., easy flow between social activities and game play, understanding what other players are doing by watching their actions). We will demonstrate two prototype games, Art of Defense on the Nokia N95 and ARhrrr! on the NVidia Tegra.

Faculty: Blair MacIntyre, Jay Bolter, Maribeth Gandy

Students: Sami Deen (MS CS), Yan Xu (HCC PhD), Ta Huynh Duy Nguyen (HCC PhD), Karthik Ravaeendran (MS CS), Kimberly Spreen (MS CS), Brian Davidson (MS CS)

Contact: duynguyen@gatech.edu (AoD), kim.spreen@gatech.edu (ARhrrr!)

Non-Photorealistic Rendering for Augmented Reality Applications

Location: Room 333

Description: Photorealistic and non-photorealistic rendering are two ways to merge virtual and real images in augmented reality. Particularly, non- photorealistic rendering (NPR) mimics artist's work and produces many interesting and appealing results. Our demos show several NPR effects (e.g., silhouette and watercolor-like) for real-time AR applications.

Faculty: Blair MacIntyre, Greg Turk

Student: Jiajian Chen

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**ClearSpace: Mixed-Reality Presence
Through Virtual ClearBoards**

Location: Room 333

Description: This project is exploring the use of large interactive video screens as a portal between a physical workspace and a shared virtual workspace. Motivated by the ClearBoard concept developed by Hiroshi Ishii, two or more users share a whiteboard from remote locations. Instead of sharing two separate locations, users see themselves projected into a single virtual workspace where not only the content but also the physical arrangement of their work persists. We are using face tracking software, a large touchscreen and a large field motion capture system to capture the head position, finger position and arm movements respectively. Part of our research focus is on the potential increase in presence felt between distributed participants when they share a highly registered shared physical space.

Faculty: Blair MacIntyre, Alex Hill

Students: Matt Bonner (PhD HCC), Aneesh Tarun (MS CS), Jacob Schiefer (MS CS)

Contact: Alex Hill ahill@gatech.edu

Parallax Viewing through Handheld Devices

Location: Room 333

Description: This project is exploring the use of motion parallax to give video see-through handheld devices a more realistic view onto the physical world. Tracking software tracks the position of the user relative to the screen and displays a perspective corrected view of the scene behind the device captured from a front-mounted high-resolution fisheye lens camera.

Faculty: Blair MacIntyre **Students:** Jacob Schiefer

Contact: Jacob Schiefer sjacob@cra.org

(In)Box with Malcom

Location: Room 333

Description: (In)box with Malcom is an interactive augmented reality experience that takes place inside a shipping container. The work explores the persona of Malcom McLean, inventor of the shipping container, and the effects of the container system itself.

Faculty: Blair MacIntyre, Jay Bolter; **Students:** Evan Barba (PhD HCC), Rebecca Rouse

(LCC) **Contact:** evanbarba@gmail.com

**Mobile Augmented Reality Leveraging
the Physical World and Virtual Content**

Location: Room 333

Description: In this demo visitors will see mobile augmented reality software overlaying virtual information such as social networking data, user generated content, and advertising with the

world around them. This demo illustrates how knowledge of the location and surroundings of a mobile user can be leveraged to create virtual augmentations that are integrated with the physical environment to create compelling applications for entertainment, productivity, advertising, and tourism.

Faculty: Maribeth Gandy, Blair MacIntyre, Alex Hill

Students: Brian Davidson (CS MS), Evan Barba (Phd HCC)

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PIXI LAB

Room 334

TwinSpace: Exploring Cross-Reality Team Spaces

Location: Room

334

Description: Virtual worlds like Second Life are increasingly popular vehicles to hold meetings, collaborate on documents, and otherwise conduct business remotely. This is reflected in the growing number of commercial products that support this model of work. What impact might this have on conference rooms, labs, and other physical places of work? In our project we explore how to connect physical and virtual spaces, so that co-located and remote groups can work seamlessly together.

Faculty: Derek Reilly, Keith Edwards

Students: Jee Yeon Hwang, Andy Echenique, Hafez Rouzati, Andy Wu, Enrique Santos

WindowScape: A Task Oriented Window Manager

Location: Room 334

Description: WindowScape is a software tool to help people perform multiple activities concurrently. Although knowledge workers frequently spend a great deal of time switching between tasks, modern commercial user interfaces provide little to aid this multitasking process. The result is often cluttered desktops, hard-to-find windows, and difficulty keeping track of one's work. We seek to overcome this with WindowScape, which provides a simple, lightweight way to view windows by the task they pertain to. But to relieve the user from having to make advance decisions about where their windows belong, we employ a novel temporal metaphor, which allows windows to be assigned to tasks implicitly, and only once the user is ready to make such decisions.

Faculty: Keith Edwards, keith@cc.gatech.edu

Student: Craig Tashman craig@cc.gatech.edu

LiquidText: A New Way to Interact with Documents

Location: Room 333

Description: We are creating a different way to read text, where the document is no longer a fixed, monolithic unit, but rather a flexible representation to be arranged, embellished and structured by the reader. Through this flexibility, one can manipulate a text to best support finding, recording, and communicating the meaning contained within it. To enable this fluid, flexible document representation, we take advantage of recent advances in touch technology,

allowing people to use natural hand movements and gestures to perform these manipulations of a text. We will present an interactive demonstration of this system to show an idea of what we are creating.

Faculty: Keith Edwards

Student: Craig Tashman

INFORMATION INTERFACES LAB

Room 333

Imprint: Visualizing Printer Traffic for Workgroups

Location: Room 333

Description: Imprint is a kiosk that visualizes data from a work group's print server. Imprint analyzes print jobs in terms of who printed the job, when it was printed, how many pieces of paper were used (as well as calculations on how much toner and how much energy were used). Imprint also analyzes the text and images that are contained in job files. Imprint displays a rotating slideshow of visualizations, each with a view into the social aspects of printer activity. The system also raises some environmental issues, but does not shame or cajole any community members. Instead our goal is to open deeper and data-driven conversations and allow community members to ask better questions about sustainability.

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Students: Zachary Pousman, Hafez Rouzati