

## CREATIVITY RESEARCH & SOCIAL COMPUTING

### Social Ideation

**Contact:** Joel Chan ([joelchuc@cs.cmu.edu](mailto:joelchuc@cs.cmu.edu))

This project investigates how social computing systems can optimize real-time creative collaboration, whether in teams or with crowds. We are actively developing a Web-based social computing system for brainstorming that facilitates managing the interactions of brainstormers with each other so that the solution space is explored with the right combination of breadth and depth. This is accomplished through real-time analysis, synthesis, and adaptive filtering of interactions between brainstormers and their ideas.

There are several opportunities on this project to gain experience working on engaging and challenging HCI research problems. For example, what are optimal ways to distribute real-time synthesis of ideas across multiple workers to maximize their value for inspiring creativity? What are the most useful visualizations and interactions that can support rapid understanding and optimal shaping of a continuously evolving solution space? How can we best manage the delicate tradeoff between being inspired by others' ideas and being fixated by others while maintaining a sense of team connectedness and synergy? Students who join this project will help to build, test, and refine system components to address these research problems, and also have the opportunity to creatively influence the direction of the project! They will gain valuable experience prototyping social computing systems and translating HCI theory into tangible software that can have a real impact. There is also the potential for co-authorship on full research papers for top-tier HCI conferences! The ideal candidate will have interests in social computing and/or creativity, and prior experience with interactive web application development (in particular, Javascript/Node and/or Meteor.js) and/or popular visualization frameworks, such as D3.js.

Interested students should email their resume and a description of their experience with web development and research interests to Joel Chan.

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## CROWDSOURCING / UX DESIGN / PRIVACY

### Crowdsourcing the Analysis of Privacy Policies

**Contact:** Florian Schaub ([fschaub@cs.cmu.edu](mailto:fschaub@cs.cmu.edu))

Privacy policies describe how websites collect, use and share the data of their users, yet, most users do not read them due to their length and complexity. The Usable Privacy Policy Project ([www.usableprivacy.org](http://www.usableprivacy.org)) aims to semi-automatically extract relevant information from these policies by combining crowdsourcing, machine learning and

natural language processing in order to be able to inform web users about those data practices and privacy issues they care about. An important aspect of this research is the development of robust crowdsourcing tasks and workflows to gather annotations. The goal of this independent study project is to design respective crowdsourcing tasks and evaluating them with experiments on Amazon Mechanical Turk and potentially other crowdsourcing platforms. Candidates should have a strong background in web design and development, crowdsourcing, and user testing.

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## EDUCATION

### **Carnegie Mellon's Global Learning XPrize Team**

**Contact:** Jack Mostow ([mostow@cs.cmu.edu](mailto:mostow@cs.cmu.edu)) or Ran Liu ([ranliu@cmu.edu](mailto:ranliu@cmu.edu))

Carnegie Mellon is competing in the \$15M Global Learning XPRIZE (<http://learning.xprize.org>) to develop an open-source Android tablet app that enables children 7-10 in developing countries to learn reading, writing, and numeracy despite having little or no access to formal education. Opportunities are available for designing, testing, and refining intelligent computer tutors for early math learning, whether for independent study credit or (where feasible) as a course project.

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## EDUCATION / LEARNING MEDIA / CIVIC ENGAGEMENT DESIGN / DATA VISUALIZATION

### **Designing Interactive Data Visualizations for Community Engagement with Green infrastructure Solutions to Reduce Pittsburgh's Storm Water Overflow**

**Contact:** Marti Louw <[martil@cmu.edu](mailto:martil@cmu.edu)>

The Learning Media Design Center is collaborating with the Carnegie Museum of Natural History, Pittsburgh Sewer and Water Authority (PSWA) and the CREATE Lab to design a public engagement event that integrates explorable high-resolution time-lapse video and data overlays to facilitate discussion and planning of community-based sustainable storm water management projects.

We are seeking one or two students (for either an independent study for units or a part-time paid research internship) to help with project design, implementation and evaluation. The ideal candidates will have prior web development experience with strong programming skills (e.g. HTML5, JavaScript) to help implement designs, and/or have knowledge of user study methods and communication/interaction design skills, and an interest in civic engagement. Experience with photography and time-lapse video is also desirable.

The HCII faculty mentor will be Marti Louw <[martil@cmu.edu](mailto:martil@cmu.edu)>, Director of the Learning Media Design Center, and the student(s) will be working closely with a Design PhD student, education staff at the museum, and the sustainability manager of PWSA to plan a public engagement event and an interactive system to foster science-informed decision-making with diverse stakeholders to collectively address this important regional water quality issue.

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## **EDUCATION / LEARNING MEDIA / CIVIC ENGAGEMENT DESIGN / DATA VISUALIZATION**

### **Rapid-Cycle Learning Product Efficacy Assessment & School Feedback**

**Contact:** Marti Louw <[martil@cmu.edu](mailto:martil@cmu.edu)>

The Learning Media Design Center at Carnegie Mellon University is collaborating with Digital Promise to support three Pittsburgh-area school districts (Avonworth, Elizabeth Forward, and South Fayette) in conducting effective short-cycle evaluations of courseware product pilots, and facilitating feedback-loop processes with participating Ed Tech companies (including Schell Games, InventorCloud, eSpark, MS OneNote) to improve product efficacy and learning. Our goal is to develop scalable assessment strategies that enable educational stakeholders to quickly gather the critical information and data needed to consider the adoption of new technology tools and courseware platforms in the classroom, and provide actionable feedback to developers.

We are looking for undergraduate or master's students with background course work in the learning sciences and educational research to participate in the development and implementation of these rapid cycle assessments. Students should be interested in visiting schools to pilot research instruments, collecting data, transcribing meeting and interview notes, and coding qualitative and quantitative data. Students can elect to receive credit for an independent study, or be paid for a part-time research internship.

The HCII faculty mentor will be Marti Louw <[martil@cmu.edu](mailto:martil@cmu.edu)>, Director of the Learning Media Design Center, and the student(s) will be working closely with a postdoctoral research associate. Successful candidates will need to obtain standard Pennsylvania Act 153 background clearances and pass an IRB certification-training module.

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## EDUCATION & SOCIAL COMPUTING

### **Building Rapport between Real and Virtual Humans**

#### **Articulab (Professor Justine Cassell)**

(Undergraduate, MHCI, and METALS Research Opportunities)

**Contact:** Torey Bocast [<vtb@cs.cmu.edu>](mailto:vtb@cs.cmu.edu)

We know that there are people who can easily make friends, instinctively knowing how to make others like them; then there are those who have to try harder – or even find it impossible to connect with others. Intrigued by the evidence that shows that rapport and interpersonal closeness leads to positive outcomes in peer tutoring, doctor-patient conversations, and many other tasks, we are studying interactions between friends and strangers to try to see how they build, maintain (and sometimes destroy!) rapport.

Using the results of our human-human study, we are then building a virtual human that will employ the same methods to build rapport with students while it tutors them, and we are building another virtual human to act as a personal assistant on Android phones. However, in order to make our virtual humans fully autonomous, there are several technical challenges we need to overcome, that involve HCI, AI, Graphics and Natural Language Processing. We have a number of open positions on these projects:

- (a) we have opportunities for undergraduate or masters students to study videos of teens and college students and determine the level of rapport between the two people, and the behaviors that go into making up that rapport (not unlike what you learned how to do in Methods). Video data annotating experience is preferable for this person, however we are willing to teach these skills.
  - (b) We also have an opportunity for a technically-skilled student to work on the language understanding and language generation aspects of the Android application. Some programming experience will be required, either in C++, C# or Java, and some understanding of natural language processing would be preferable but not required. We also provide opportunities for motivated students to be given authorship on papers or pursue their own research questions. Please send your resume to lab manager Torey Bocast [<vtb@cs.cmu.edu>](mailto:vtb@cs.cmu.edu) if you are interested, and let her know which project you wish to be considered for.
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## EDUCATION

### Detecting Classroom Talk

**Contact:** David Gerritsen ([davidalso@gmail.com](mailto:davidalso@gmail.com))

We are developing a system that uses the microphone arrays on MS kinects to automatically detect who is speaking in a class. The goal of this system is to provide both real-time and post-event feedback to TAs in order to help them improve their teaching.

We are looking for a few undergraduate and master student research assistants to help us with this work - you may choose to work on only one or various aspects of the project. We need help with ...

- Hacking on kinects to improve speaker detection - machine learning skills are a plus!
- Designing persuasive feedback interfaces that help TAs improve their teaching
- Collecting behavioral data from TA-led recitation sections

Participation on this project will earn students independent study credit (6 or 12 units) If you are interested in playing with new technology and making classes better, please send a resume, a short description of you relevant experience, and three CMU instructors as references to David Gerritsen: [davidalso@gmail.com](mailto:davidalso@gmail.com)

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## EDUCATION & SOCIAL COMPUTING

### Promoting academic opportunity for culturally-underrepresented elementary school students

**Articulab (Professor Justine Cassell)**

(Undergraduate, MHCI, and METALS Research Opportunities)

**Contact:** Torey Bocast <[vtb@cs.cmu.edu](mailto:vtb@cs.cmu.edu)>

Standard English is often required in schools, even though many students bring diverse language and dialect backgrounds to the classroom. Unfortunately, well-intentioned teachers are often unprepared to effectively talk with their students about dialect, and many researchers posit that this contributes to a harmful classroom culture which in turn leads to the persistent achievement gap between Caucasian students and students of color. In our work we use virtual peers – life-size artificial intelligence systems that look and act like children – to help students understand dialect differences while supporting their pride in their cultural and linguistic heritage. We are looking for undergraduate or masters students to help us conduct research in this area. Students should be interested in going into schools to collect data, and transcribing / annotating this data for interesting social, verbal, and non-verbal behaviors that play a role in cultural identity. Any student background may be applicable, though those with an

interest in human communication, linguistics, HCI, information sciences, African American studies, or education may be a particularly good fit. We will also provide opportunities for motivated students to be given authorship on papers or pursue their own research questions. Please send your resume to lab manager Torey Bocast <[vtb@cs.cmu.edu](mailto:vtb@cs.cmu.edu)> if you are interested, and let her know which project you wish to be considered for.

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## FABRICATION

### **Post Mortem: Learning from Failed 3D Printed Objects**

**Contact:** Anthony Chen ([xiangchen@acm.org](mailto:xiangchen@acm.org))

Learning from failure is critically important for acquiring and mastering a skill; yet for digital fabrication to date there is no systematic way to do so. If we consider the failed fabricated artifacts as input, the goal of this project is to design and build a system that processes such information, and outputs analysis, instructions or some form of knowledge that could help makers fix the current issue and improve their future fabrication experience.

Student Requirements: Some programming skill or fabrication experience desired.

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## GAME RESEARCH

### **SCIP: Sensing Curiosity in Play**

**Jessica Hammer / Ludolab**

**Contact:** Justin Puglisi ([jpuglisi@cs.cmu.edu](mailto:jpuglisi@cs.cmu.edu))

Our team is designing games to help middle-schoolers retain a sense of curiosity, exploration, and play as they make the transition into their new stage of life. You'll be helping develop a framework about types of curiosity in play, similar to Costikyan's work on uncertainty. We'll review the literature on curiosity, identify games that deserve deeper investigation, and investigate how players experience and express curiosity during play.

We particularly welcome applications from students with a background in social science, education, or design.

## GAME RESEARCH

### Games for Health

**Jessica Hammer / Ludolab**

**Contact:** Justin Puglisi ([jpuglisi@cs.cmu.edu](mailto:jpuglisi@cs.cmu.edu))

We are studying how games for health connect play behaviors to desired health outcomes. You will be reviewing the literature, identifying games for health on which no papers have been written, and helping categorize and analyze games for health.

Students should have an interest in games, healthcare, or both. Experience with literature searches and/or qualitative research methods is a plus.

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## HEALTH

### Independent Living Through Virtual Coaches

**Contact:** Dan Siewiorek <[dps@cs.cmu.edu](mailto:dps@cs.cmu.edu)> or Asim Smailagic <[asim@cs.cmu.edu](mailto:asim@cs.cmu.edu)>

We have a series of projects whose goal is to enable older adults and people with disability live independent longer. We have been developing capabilities based on smart environments and wearable sensors (Google Glass, Fitbit, Apple Watch, heart rate, etc.) that help cognitive and physical decline.

For example we have developed a stroke rehabilitation coach that can monitor a users exercises, provide encouragement and correction if necessary, automatically adjusting goals based on improved performance. Dialog with the coach is monitored to detect the users emotional state (neutral, frustrated, anger, in pain) and appropriately modifying coaching instructions. User engagement is promoted in casting each exercise type in the form of a virtual reality game.

There are a number of project opportunities to extend virtual coaches into assistants for cognitively challenging activities such as training in procedures for medical trainees and caregivers. We will work with the STAR Center whose vision is “to provide a multidisciplinary simulation center where students, practitioners and members of the allied health community can practice and perfect their clinical skills to meet the needs of their patients, family and community they serve”. More information on the STAR Center can be found at: <https://www.ahn.org/education/star-center>

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## HEALTH

### **Designing a Usable Tablet-Based Medical Decision Aid**

**Contact:** Brad Myers [bam@cs.cmu.edu](mailto:bam@cs.cmu.edu)

In collaboration with Dr. Doug White from the Department of Critical Care Medicine at the University of Pittsburgh, we are designing a web-enabled, tablet-based system to help the families of critically ill, incapacitated patient communicate with the medical care team and make decisions about treatments for the patient. The decision to continue life-sustaining treatment for these patients is a complex, value-laden decision as it involves highly invasive treatments to potentially achieve quality of life improvements without conferring a straightforward recovery.

The goal of the research project is to design and prototype a web-based decision aid based on semi-structured interviews and the principles of user-centered design. *The HCI team will use a think aloud methodology with stakeholders to assess how well an existing low-fidelity prototype would work for patients' families. The team will use iterative usability testing to identify areas that need further refinement or development. The ultimate goal is to design a refined prototype that is ready for programming and ultimately testing in patients' families in the ICU. The HCI team will be responsible for updating the tool's design, conducting usability testing, and—in conjunction with the University of Pittsburgh team—corresponding with programmers.* This project will also result in publishable papers, on which you may be a co-author.

The contact people will be Brad Myers at CMU and Dr. Doug White from the University of Pittsburgh and UPMC. One or both will meet with the students weekly. Dr. White will be able to provide patients and families in the target group who can be participants, and will arrange for the students to be covered under his IRB.

This project is open to students, who are at any level: undergrad, Masters or PhD, and who have 12 hours/week available for Fall 2015, Spring 2016, and/or Summer 2016. Students are encouraged to work for course credit, but may work for pay instead.

If you are interested in this project, please send by email to [bam@cs.cmu.edu](mailto:bam@cs.cmu.edu) the following:

- (1) Your resume.
  - (2) A description of your experience with HCI methods. (For example, have you done contextual inquiry, think-alouds, etc.?)
  - (3) Your grades in any HCI-related courses.
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## HEALTH

### **Development of Android health app for cancer patients**

**Contact:** Dr. Grace Bae ([gracebae@andrew.cmu.edu](mailto:gracebae@andrew.cmu.edu)), Ubicomp Lab. HCI

Our research aims to study the impact of design on an context-trigger based Android application for cancer patients. Traditional retrospective questionnaires make it challenging for cancer patients to recall their health status at a follow-up appointment. Retrospective data are subject to a number of errors and recall biases that may distort the data and affect conclusions made about the data (Shiffman, 2000). In order to assist patients' health report in real-time during chemotherapy, we will explore how cancer patients can effectively log their symptoms, and mood states using Android application when the app provides their physical and physiological context such as steps and heart rates.

Task description:

We would like to work with students who can develop an Android application.

Specifically, students will develop software

- 1) To access real-time sensor data (e.g. Fitbit) on an Android device
- 2) To display data streams as graphs along with the real-time changes of individuals' current vital signs and activities
- 3) To give notifications and guidance to individuals at a critical moment (e.g., If the patients' heart rate are lower or greater than threshold values) and work on automatically regulating the intervention timings for these individuals.

Required background:

Java, Android programming, experience with Android SDK, third-party libraries and APIs

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## INTELLIGENT INFORMATION SYSTEMS

### **Intelligent Information Systems and Interactive Driver Interfaces in Cars**

**Contact person:** Dr. SeungJun Kim ([sjunikim@cs.cmu.edu](mailto:sjunikim@cs.cmu.edu))

The goal of this project is to design intelligent information systems that enable drivers to naturally interact with information and computation in cars. We will start from quick brainstorming of use case scenarios and then design a series of working prototypes and experimental conditions for a user study. Engineering or programming tasks can include adaptive map visualization, voice command design, haptic cue design, communication with information server or database, and so on.

Student requirements: Python and/or Java

## INTERACTION TECHNIQUES

### Cross-Device Interaction

**Contact:** Michael Nebeling <[nebeling@cmu.edu](mailto:nebeling@cmu.edu)>

Despite increasingly powerful wearable devices such as smartwatches, the available functionality and especially input capabilities are still severely limited, making them impractical for many complex tasks common to desktop environments. Rather than trying to modify the hardware or develop new input methods as being done by other researchers, this project is exploring two new directions. First, we are investigating how involving other devices can provide new interaction possibilities and enable tasks that are difficult to do using a small device alone. Second, we are studying how involving other users via crowdsourcing techniques and getting them to complete complex tasks on the smartwatch user's behalf can overcome physical constraints of the small form factor. This research adds to a growing body of knowledge on wearable interfaces, cross-device interaction, and crowdsourcing. The two main research questions are: (1) Which technical features are required and what are suitable interaction techniques to integrate and combine multiple devices with a wearable interface? (2) What are appropriate techniques for managing crowds from a wearable device and which kinds of tasks can be completed by workers on the user's behalf? Recent prototypes we have developed include a cross-device web browser that allows users to split web pages and distribute content between a smartwatch and other devices, as well as a wearable interface to Google Docs allowing users to write and edit papers from their watch by directing crowd workers via speech commands.

Student requirements:

At the minimum, students should have programming experience and should be interested in working with mobile/wearable and web technologies. Ideally, students are familiar with Android Mobile and Android Wear development as well as state-of-the-art web technologies, including HTML5/CSS3, JavaScript/jQuery, Node.js, and PHP.

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## PRIVACY

### Design and Evaluation of Personalized Privacy Assistants

**Contact:** Norman Sadeh ([sadeh@cs.cmu.edu](mailto:sadeh@cs.cmu.edu)) and/or his assistant Linda Moreci ([laf20@cs.cmu.edu](mailto:laf20@cs.cmu.edu))

The goal of this independent study project is to design and evaluate novel dialogue and UI functionality aimed at leveraging models of people's privacy preferences (obtained using machine learning) to help users configure mobile app privacy settings. The study will include exploring multiple possible designs, evaluating their usability (e.g. user burden) as well as their overall impact on user behavior and comfort. This study will be

conducted in the context of a new project with Google aimed at developing personalized privacy assistants for the Internet of Things (e.g. See recent article in campus technology at: <http://campustechnology.com/articles/2015/07/13/carnegie-mellon-to-lead-internet-of-things-expedition.aspx?admgarea=news> or CMU press release at <http://www.cmu.edu/news/stories/archives/2015/july/google-internet-of-things.html>). Candidates should have a strong background in web design and development, as well as experience with user testing.

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## **PRIVACY / UX DESIGN / WEB ENGINEERING**

### **Browser Plugin to Enhance Privacy Awareness**

**Contact:** Florian Schaub ([fschaub@cs.cmu.edu](mailto:fschaub@cs.cmu.edu))

The goal of this independent study project is the design and development of a browser plugin to enhance the privacy awareness of web users. This plugin will provide users with relevant and actionable information about a website's privacy practices. The independent study will be conducted as part of the Usable Privacy Policy Project ([www.usableprivacy.org](http://www.usableprivacy.org)) and will consist of designing, prototyping and evaluating different user experiences for the plugin in a user-centered design process. Candidates should have a strong background in web design and development, as well as experience with user testing.

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## **PRIVACY/UX DESIGN/WEB ENGINEERING**

### **Privacy Awareness Website**

**Contact:** Florian Schaub ([fschaub@cs.cmu.edu](mailto:fschaub@cs.cmu.edu))

Goal of this independent study project is the conceptual design and practical development of a website that enables individuals to explore and compare privacy practices of websites. Information on data practices is collected as part of the Usable Privacy Policy Project ([www.usableprivacy.org](http://www.usableprivacy.org)). The envisioned website will present potentially complex information extracted from a website's privacy policy in an accessible and engaging way by providing multiple layers of explorations and visualizations. Candidates should have a strong background in web design and development, as well as experience with user testing.

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## SECURITY

**Contact:** Josh Tan ([jstan@cs.cmu.edu](mailto:jstan@cs.cmu.edu))

Many secure messaging apps are available in app marketplaces. These apps take a variety of approaches to providing different privacy and security features, which may have different effects on usability. The goal of this project is to perform a usability evaluation of the most popular secure messaging apps using lab-based user studies. The student will assist in preparing and running these user studies.

Student Requirements:

Students should have strong English proficiency and be interested in performing qualitative research. Prior HCI experience will also be helpful.

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## SECURITY / INFO VIZ

### Designing a Better Password Meter

**Contact:** Blase Ur ([bur@cmu.edu](mailto:bur@cmu.edu))

Password meters---the bars that indicate whether a password you create is "strong" or "weak"--- are everywhere. Unfortunately, they're also often just plain wrong, rating good passwords as "weak" and vice versa. Our lab is in the process of developing an open-source tool to provide users feedback on their passwords. Beyond having a much more accurate model of password strength than existing meters, it will also focus on providing users with detailed explanations of \*why\* their password is weak and how it could be better.

Much of the backend of this project has already been built, and we are about to design how to present this information. Based on their interests research assistants on this project will have the opportunity to contribute design concepts, visualizations, and code to the project.

Student requirements: Nothing is strictly required other than a good sense of design. Knowledge of CSS/HTML5 and Javascript would be quite helpful, but you can pick it up along the way.

Contact person: Blase Ur ([bur@cmu.edu](mailto:bur@cmu.edu)), a 5th-year PhD student in Professor Lorrie Cranor's CUPS lab

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## SMARTPHONES

### **Inferring Interests and Activities based on Geotagged Photos and Tweets**

**Contact:** Jason Hong (jasonh@cs.cmu.edu)

How much can your smartphone infer about you based on your photos and tweets, if all it had were your geotags? Can it figure out that you like baseball, apples, or Taylor Swift? Can it figure out where you went on vacation, where your friends live, and what kinds of activities you like doing? This project will involve (a) extracting a person's geotags, (b) crawling metadata from Yelp, Flickr, Foursquare, and other places to understand what those places are and what people do there, and (c) combining these two to build a model of a person's interests and activities. Looking for 1-2 people with dev skills for this work.

Ideal Skills: Some subset of Android programming, web programming, databases, machine learning

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## SMARTPHONES

### **Intelligent Agents for Improving People's Health Behaviors**

**Contact:** Jason Hong (jasonh@cs.cmu.edu)

Our long-term goal is to create intelligent agents for smartphones and wearables that use machine learning and psychological theories of motivation to change people's behaviors and ultimately reduce the impact of chronic health problems like obesity, hypertension, and diabetes. For this project, our first step will be to talk to health coaches and doctors to understand what kinds of strategies work and which ones don't, develop paper prototypes and medium-fidelity prototypes, and evaluate those with health practitioners and potential patients. Looking for 1-2 people to help out.

Ideal Skills: Some subset of HCI, UX, paper prototyping, prototyping tools (like Balsamiq, Marvel, Flinto), interviewing, people skills

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## SOCIAL COMPUTING

### **Redesigning Online Health Support Groups**

**Contact:** Robert Kraut [robert.kraut@cmu.edu](mailto:robert.kraut@cmu.edu)

A high percentage of people with chronic or life-threatening diseases participate in online health support groups to exchange informational and emotional support with other patients and caregivers. We are working with the American Cancer Society to redesign their Cancer Support Network (CSN) to make it more effective. The Cancer

Support Networks is the largest online support group in the world for people suffering from cancer.

This project is for you if you want to improve cancer survivor's quality of life by applying your skills in interaction design, usability analysis and testing, social science research, machine learning or programming. Our goal is to improve the experiences people have when participating in online health support groups.

You will have access to log data containing all communication exchanged on the CSN site and surveys of CSN users describing their motives for use and evaluation of components of the site. You will also have the ability to conduct remote interviews with both experienced and new users of the site and to conduct remote usability testing. You will work collaboratively with PhD students, who are building back-end algorithms recommending content and relationships to people on the site.

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## **SOCIAL COMPUTING**

### **Digital Footprints**

**Contact:** Laura Dabbish ([dabbish@cs.cmu.edu](mailto:dabbish@cs.cmu.edu))

The Internet increasingly reveals personal information about people to each other and to third parties. The goal of this research is to understand how people manage their digital footprints on the Internet, and explore different interaction techniques to help people manage their information. You will learn about HCI and social science research, be involved in developing novel software for showing people information they reveal on wireless networks, designing and running user studies and analyzing data. Interested students should send their resume and major GPA to [dabbish@cs.cmu.edu](mailto:dabbish@cs.cmu.edu).

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## **SOCIAL COMPUTING**

### **Visualizing social interactions**

**Contact:** Laura Dabbish ([dabbish@cs.cmu.edu](mailto:dabbish@cs.cmu.edu)) & [mkleee@cs.cmu.edu](mailto:mkleee@cs.cmu.edu)

We're designing and building novel info viz of social interaction using Kinect sensor data. For example, we are building "rapport-meter," an application that senses gestures and body position of two people having a F2F conversation. The independent study students on this project will help us extend "rapport-meter" to give feedback about how well an interaction is going. We'll also explore what happens when you use the 'rapport meter' in real-life situations such as job interviews, physician consultations or first dates. The project will involve creativity AND programming. Familiarity with processing, javascript, flex, flash, interaction design skills, love of data, and interest in social interaction and/or

physiological sensing would a plus. Interested students should send their resume and major GPA to [dabbish@cs.cmu.edu](mailto:dabbish@cs.cmu.edu) and [mkleee@cs.cmu.edu](mailto:mkleee@cs.cmu.edu).

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## **SOCIAL COMPUTING**

### **Understanding Cultural Differences in Social Gaze Behaviors**

Contact: Laura Dabbish ([dabbish@cs.cmu.edu](mailto:dabbish@cs.cmu.edu)) & [mkleee@cs.cmu.edu](mailto:mkleee@cs.cmu.edu).

We're studying how people with different cultural backgrounds use gaze during communication. We will use Tobii eye-tracking glasses (<http://www.tobii.com/en/eye-tracking-research/global/products/hardware/tobii-glasses-eye-tracker/>). The independent study students on this project will learn how to conduct lab experiments with human subjects. They will also learn how to use eye-tracking equipment to measure gaze, including how to operate the equipment and analyze gaze data. Interested students should send their resume and major GPA to [dabbish@cs.cmu.edu](mailto:dabbish@cs.cmu.edu) and [mkleee@cs.cmu.edu](mailto:mkleee@cs.cmu.edu).

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## **SOCIAL COMPUTING**

### **Social Transparency and Emotional Response to Critique**

Contact: Felicia Ng ([felicia.ng.93@gmail.com](mailto:felicia.ng.93@gmail.com))

We're conducting a series of studies to examine how people respond to critique, comments, and feedback on their work depending on the amount of contextual information available about the person critiquing them. We will use several physiological indicators such as GSR (Galvanic skin responses) and ECG (electrocardiogram) as well as facial and bodily expressions to measure such responses. The independent study students on this project will learn how to conduct lab experiments with human subjects. They will also learn to carry out physiological measurements including operating the equipment and analyzing the data. Interested students should send their resume and major GPA to Felicia Ng ([felicia.ng.93@gmail.com](mailto:felicia.ng.93@gmail.com)).

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## **SOCIAL COMPUTING**

### **Visualizing Signals for Software Developers**

Contact: Jason Tsay ([jtsay@cs.cmu.edu](mailto:jtsay@cs.cmu.edu))

Developers, project managers, and even recruiters are using social information as signals to help answer development-related questions that are normally hard to answer.

For example: "Will accepting this code contribution from somebody I don't know totally destroy my project? Let's see what other code this person has written." In this project we are developing a web-based tool that aggregates these signals about software developers in order to help answer these questions quickly and easily. We are looking for students who are interested in web design or web programming (front-end or back-end). Familiarity with (or interested in learning) Python or Ruby a plus. Javascript also a plus. Experience or familiarity with GitHub and/or open source software a \*huge\* plus. Interested students should send their resume and major GPA to Jason Tsay ([jtsay@cs.cmu.edu](mailto:jtsay@cs.cmu.edu)).

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## **SOCIAL COMPUTING**

### **Social Cybersecurity**

**Contact:** Laura Dabbish ([dabbish@cs.cmu.edu](mailto:dabbish@cs.cmu.edu))

How do people learn about cybersecurity? What do they talk about regarding cybersecurity? What kinds of social techniques can we apply to influence people's awareness, knowledge, and motivation to be secure? We're deploying a cybersecurity quiz and we're looking for independent study students with design interest / expertise to help us improve the interaction design of the quiz. The independent study student will work on laying out and designing interfaces in Photoshop or Illustrator, with html / css ability a plus. Interested students should send their resume and major GPA to [dabbish@cs.cmu.edu](mailto:dabbish@cs.cmu.edu).

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## **SOCIAL COMPUTING & DESIGN RESEARCH**

### **Online Feedback for Design**

**Contact:** Steven Dow ([spdow@cs.cmu.edu](mailto:spdow@cs.cmu.edu))

This project explores novel opportunities for how can innovators obtain and make sense of diverse feedback from potential stakeholders or customers. We have been developing tools to enable innovators to post designs, to author evaluation criteria, to recruit feedback providers through social media or other online forums, and to visualize conflicting feedback so as to prioritize changes for future iterations of designs. The goal is to enable people to obtain authentic, honest, and knowledgeable feedback with clear and actionable steps forward.

We are looking for undergraduate or masters students to contribute to this research. You may aid in development of interactive tools for exchanging feedback and/or help us run/analyze online experiments. We seek applicants with knowledge of basic Web programming (HTML, PHP, and JavaScript) or with background in psychology or learning science. You will gain the opportunity to work with experts in HCI and learning science

and to creatively influence the direction of the research! Former student collaborators have gone on to top graduate programs, and have co-authored full research papers accepted to top-tier HCI conferences.

If interested, please email your resume and a short description of your experience with web development and research experiments to Steven Dow.

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## SOCIAL COMPUTING & LEARNING SCIENCE

### PeerPresents

**Contact:** Amy Shannon ([amyshann@andrew.cmu.edu](mailto:amyshann@andrew.cmu.edu))

Our team seeks to improve peer feedback on student presentations. Many college courses require students to give in-class presentations. This raises a number of challenges. Students who watch the presentation are typically not participating actively. Professors can be overwhelmed trying to provide feedback while also managing the class. The presenting students would benefit from receiving more feedback than the professor can provide. This project introduces PeerPresents, an in-class peer feedback system we developed to improve the feedback process for in-class presentations. We are looking for undergraduates to help develop the tool, implement classroom studies, and analyze data. Ideal candidates will be familiar with Javascript, Node.js, CSS, MongoDB. You will have the opportunity to work with experts in HCI, learning science, and game design and to creatively influence the direction of the research!

If interested, please email your resume to Amy Shannon.

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## USABLE PRIVACY & SECURITY

### Social Cybersecurity Quiz

**Contact:** Jason Hong ([jasonh@cs.cmu.edu](mailto:jasonh@cs.cmu.edu)) and Laura Dabbish ([dabbish@cs.cmu.edu](mailto:dabbish@cs.cmu.edu))

The long-term goal of this project is to understand how to use strategies from social psychology to improve people's awareness, knowledge, and motivation to be secure online. In this specific project, we're looking to deploy an online quiz that uses different tactics, to see how it influences people's behaviors. We are looking for someone who can help with the visual design of the quiz, as well as some of the content of the quiz questions.

**Ideal Skills:** Some subset of visual design, interaction design, some knowledge of cybersecurity (or willingness to learn)

## **USABLE PRIVACY & SECURITY**

### **PrivacyGrade: Improving App Privacy for Kids**

**Contact:** Jason Hong (jasonh@cs.cmu.edu)

The broad goal of the PrivacyGrade project is to help developers, consumers, and regulators understand and improve the privacy of smartphone apps. For this specific project, we are looking at improving app privacy for kids, so that they comply with the Children's Online Privacy Protection Act. The goals include (1) refining our machine learning algorithms for detecting apps that target kids, (2) using a variety of techniques to detect apps that are collecting too much information, and (3) summarizing the results so that regulators (like the Federal Trade Commission) can inspect further.

Ideal Skills: Some subset of Android programming, statistics, machine learning, computer vision

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## **USABLE PRIVACY & SECURITY**

### **PrivacyGrade: Crowd Analysis of Android Apps**

**Contact:** Jason Hong (jasonh@cs.cmu.edu)

The broad goal of the PrivacyGrade project is to help developers, consumers, and regulators understand and improve the privacy of smartphone apps. For this specific project, we want to add new functionality to PrivacyGrade.org so that volunteers can come to our site and help rate the acceptability of various app behaviors, as well as flag unusual behaviors. Example questions might include things like "Does this seem to be an app designed specifically for children?" and "How comfortable are you with this app using your location data for advertising?" Looking for 1-2 people for this project.

Ideal Skills: Some subset of Android programming, machine learning, web programming, databases, crowdsourcing, visual design

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## **USABLE PRIVACY & SECURITY**

### **Crowd Analysis of Terms and Conditions and of Privacy Policies**

**Contact:** Jason Hong (jasonh@cs.cmu.edu)

Our long-term goal is to develop techniques that can summarize and flag unusual statements in Terms and Condition policies and in Privacy Policies. Our approach is to use crowdsourcing to gather lots of data about what people find acceptable and not acceptable (or surprising), and then use this data to train NLP techniques to do the above. For this specific project, there are two major tasks (for 1-2 people). The first is to

create a crawler to get Terms and Conditions and Privacy Policies from the top 1000 web sites. The second is to create and deploy a site where volunteers can help compare statements in policies, making it easier for us to gather data on thousands of policies.

Ideal Skills: Some subset web programming, databases, crowdsourcing, visual design

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## **WEARABLE DEVICES**

### **Wearable Devices as a Universal User Interface to Interact with the Real World**

**Contact:** Dr. SeungJun Kim (sjunikim@cs.cmu.edu)

The goal of this project is to explore the usability and expandability of wearable applications and then make wearable devices (e.g., smart watches, wrist bands, etc) participate in our real-world activities. We will identify 2~3 use case scenarios, and then create working demos by using a set of wearable devices or sensors. Students will be asked to test/use a set of wearable devices in their natural environments, and engineering or programming tasks may include some Android programming (i.e., Java).

Student requirements: Python and/or Java

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## **WEARABLE DEVICES**

### **Balanced Campus**

**Contact:** Afsaneh Doryab (adoryab@cs.cmu.edu)

We have an exciting project that uses passive and automatic sensing data from smartphones, smart watches, and other wearable devices to assess students' physical and mental health (e.g., depression, loneliness, stress), academic performance (grades across all their classes, term GPA and cumulative GPA) and behavioral trends (e.g., how stress, sleep, visits to the gym, etc. change in response to college workload -- i.e., assignments, midterms, finals -- as the term progresses). Students in this project will develop applications to 1) automatically collect physiological and behavioral data from devices, 2) visualize, and 3) analyze the data.

Required qualifications include programming skills in Java, JavaScript, Python, Android and/or IOS development. Experience and interest in data analytics (machine learning, data mining, statistics, and visualization techniques) are preferred. We welcome students who are curious about research problems, are energetic, and learn fast.