

## APPLICATION DEVELOPMENT, SENSEMAKING, USER RESEARCH

Categories: Application Development, Sensemaking, User Research

Title: Fuse — Helping Users Make Sense of the Web

Contact: Nathan Hahn ([nhahn@cs.cmu.edu](mailto:nhahn@cs.cmu.edu))

Faculty: Niki Kittur ([nkittur@cs.cmu.edu](mailto:nkittur@cs.cmu.edu))

We are working to reimagine how individuals use browsers to find and manage complex information online. The web has become an information paradise — we can discover where to eat, what new laptop we should buy, and even where we should go on our next vacation. Not only are we doing this more and more, but there are a growing number of opinions and resources with answers to our questions. Should we be using tabs to organize all of this information? How can we save and organize what we find? What if we want to share our findings with someone else? We've been developing an application for the past couple of years that crystalizes some of our research into an end-user product: Fuse (<https://getfuse.io>).

We are looking for students who are interested in working with Fuse by expanding or improving on what it current does. Possible independent study or for pay RA position projects would include:

- Redesigning and improving the current user interface to provide an easier to navigate and more cohesive user experience
- Building out additional views and capabilities for users to capture, structure, reorganize and synthesize their collected data.
- Developing an iOS companion application to the current Chrome extension React application
- Adding collaborative features to allow for a better browsing experience among friends / colleagues
- Work our current prototypes to perform user testing, including: think alouds, diary studies, questionnaires, and A/B tests

We are looking for a wide range of individuals, including those with experience and a desire to expand their: Design, UI or UX skills, Font-end development (React, Firebase, iOS) abilities, and programming capabilities (Objective-C, Node.js). Anyone interested can send an email to Nathan Hahn ([nhahn@cs.cmu.edu](mailto:nhahn@cs.cmu.edu)), and include a brief description of why they are interested in the project, along with their resume and GPA if available.

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## COMPUTATIONAL FABRICATION

Research Category: Computational Fabrication

One paragraph project description: We're exploring how the combination of light and printed structures (2D and 3D) can create interactive experiences and hidden content on physical and digital displays. In this project, you'll take a hands-on approach to fabricating some of these experiences via Moiré Patterns, and you'll help work towards building a tool for others to do it too!

Student requirements: Curiosity with a willingness to experiment. Familiarity with Adobe Illustrator or 3D modeling tools (e.g., Fusion 360). Familiarity with Processing or other programming experience (e.g., Java, Python, Javascript).

Contact person: Michael Rivera ([mlrivera@andrew.cmu.edu](mailto:mlrivera@andrew.cmu.edu))

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## COMPUTATIONAL FABRICATION

ActivityStructures: digital fabrication of interactive room scale structures with embedded fiber optic bragg-grating sensors, and displays.

We are seeking 1-2 Undergraduate and / or graduate students for assistance in the development of interactive molded structures. The project scope includes development of a custom CNC mechanism to inject into material fiber optic displays molds, layout design of fiber optic sensors embedded in the materials, and

application of signal processing and machine learning to classify various human activities / interactions with the structures. The study will assist with construction of the material prototypes, implementation of experimental scenarios, and development of the data analysis algorithm for activity classification. The student (s) will work in collaboration with PhD students in the Department of Civil and Environmental Engineering and the Human-Computer Interaction Institute (HCI) as part of Professor HaeYoung Noh Professor Scott Hudson's research groups.

Ideally students will have experience with digital fabrication, signal processing, and / or machine learning, but consideration will also be given to students with strong interest and motivation in similar areas. For more information contact Sai Swaminathan ([saiganes@cs.cmu.edu](mailto:saiganes@cs.cmu.edu)) or Jonathon Fagert ([jfagert@cmu.edu](mailto:jfagert@cmu.edu)).

Video link of the working prototype: <https://tinyurl.com/moldedoptics>

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## DESIGN

### **Design and HCI students wanted Project: How to Design for Engagement**

The goal of this project is to derive a set of design guidelines and recommendations for how to design for engagement. The goal is to review the literature, current products and systems, and to create a set of findings and recommendations about what works well and why.

This is a Fall, 2019 independent study. Students can register for 6 or 9 credits. We will meet once a week.

We are looking for 2-3 undergrads or master's students with experience in doing research and UI/UX design. Programming or electronics skills are not essential. The team will work

a faculty member to review literature and examples of products, systems, and apps that require long-term engagement to achieve results. Deliverables will take the form of slides that convey findings and recommendations about what works well and why.

If you are interested please send email to Jodi Forlizzi, [forlizzi@cs.cmu.edu](mailto:forlizzi@cs.cmu.edu).

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## DIGITAL FABRICATION/ACCESSIBILITY

### **Talking Tactile Surface Indicator: Digital fabrication of Interactive Tactile Surface Indicators for Navigation and Spatial Awareness of Visually Impaired Users**

Patrick Carrington

Contact: Patrick Carrington ([pcarrington@cmu.edu](mailto:pcarrington@cmu.edu))

We are seeking 1-2 undergraduate and/or graduate students for assistance in the development of interactive tactile pavement structures. Tactile pavement structures, also known as ground surface indicators, are useful for assisting blind and other visually impaired users with navigating a city. We are developing interactive tactile pavement structures with new manufacturing techniques, such as 3D printing, thermoforming, etc, to enable visually impaired users to query information while interacting with them.

Fall 2019

The project scope includes the development of prototypes with a desktop vacuum forming machine (Mayku FormBox -- <https://www.mayku.me/>), layout design of tactile molds, embedding pressure sensors in different materials, and programming sensors and interactions with the structures. There will also be a human-subject study with blind users focusing on the construction of the material prototypes and the implementation of experimental scenarios. The student (s) will work in collaboration with Ph.D. students in the Human-Computer Interaction Institute (HCI) and Professor Patrick Carrington's research group.

Ideally, students will have experience with digital fabrication, Arduino programming, and working with sensors but consideration will also be given to students with strong interest and motivation to learn in similar areas. For more information, contact Sai Swaminathan ([saiganes@cs.cmu.edu](mailto:saiganes@cs.cmu.edu)) or Patrick Carrington ([pcarrington@cmu.edu](mailto:pcarrington@cmu.edu)).

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## EDUCATIONAL TECHNOLOGY

### Authoring Tools for Easy Creation of Adaptive Tutoring Software

**Contact:** Vincent Aleven, [aleven@cs.cmu.edu](mailto:aleven@cs.cmu.edu)

**Student Requirements:** programming in JavaScript, HTML, CSS; Java familiarity helpful

What if homework problems could help you as you worked, as if they came with a tutor who could give step-by-step hints and immediate feedback whenever you did something wrong? Then you might not spend hours in confusion, only to hand in your paper and wait a day or more for help. Our lab's goal is make it easy for teachers

to create online learning-by-doing exercises with this kind of tutoring built in. These self-guiding, self-grading homework problems are useful especially where human help is impractical, as in MOOCs. Studies show that this kind of adaptive tutoring software can dramatically aid learning, but adoption has been limited, in part because it has traditionally required advanced AI programming skills. In response, our lab invented the Cognitive Tutor Authoring Tools (CTAT: <https://github.com/CMUCTAT/CTAT/wiki>), by which *non-programmers* can create these software tutors. CTAT, which incorporates programming-by-demonstration and other end-user programming techniques, has been used to build dozens of tutors in math, science, foreign languages and other fields. But so far it has remained a tool for researchers: we want it to serve teachers and the instructional designers who write textbooks.

We seek a student willing to make CTAT attractive to these users. We want to make the current desktop Java application web-based and to improve authors' interactions. We have many specific ideas for improvements, and we could provide access to users so that the student could discover new requirements. Mentoring is available both from the professor and from the CTAT project's professional staff.

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## GAME RESEARCH

### **Phipps Game Design Challenge (Organizer / Designer)**

Jessica Hammer / OH!Lab

Contact: Emily Johns (ejohns@hipps.conservatory.org)

Game designer needed for collaboration with Phipps Conservatory. Phipps is organizing a game design challenge for middle- and high-school students as part of the Phipps Fairchild Challenge program. They are looking for help running game design workshops for students, pulling together relevant resources, and providing feedback on challenge entries.

You must be able to spend a minimum of four hours per week on-site at Phipps Conservatory working with their science education team. Prior experience with game design (e.g. taking a class, participating in GCS, working on a game-related research project) is recommended.

This position is available as an independent study.

Please email Emily Johns if you are interested in this position.

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## GAME RESEARCH

### **Games for Health Projects (Research Assistant / Programmer)**

Jessica Hammer / OH!Lab

Contact: Rina R. Wehbe (rina.wehbe@uwaterloo.ca)

One or more research assistants needed to help with the development and data collection of a large public display game for health. The study is multipurpose and will explore the social factors affecting the use of public large displays and also seek to reduce stigma around mental health via gaming in a public platform.

Students applying for the position must be strong coders with some Java/C# experience. Experience with Unity engine or Processing Platform is an asset. Networking, Multi-touch Display, Touch Screen application work is an asset.

This project is a collaboration between the University of Waterloo and CMU. Advisor will meet weekly through Skype and later in person. Students must be independent workers who are motivated and committed to the project.

This opportunity can be filled either as a paid position or as an independent study.

Please email Rina if you are interested in this position.

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## GAME RESEARCH

### **Player-Programmed Partner Games (Game Designer)**

Erik Harpstead, Jessica Hammer / OH!Lab  
Contact: Erik Harpstead ([harpstead@cmu.edu](mailto:harpstead@cmu.edu))

One or more game designers needed to help with initial design and prototyping of a transformational game to teach coding and computational thinking skills based around a co-robotic (robots that work with humans to accomplish tasks that neither could do alone) game design concept for learners in low-resource environments. This is the initial phase of what will ultimately be a multi-year project.

Students interested in this position must have some prior experience in early stage concept design for interactive technologies. Prior experience designing games or with CS education would be desirable but is not a strict requirement.

This opportunity can only be filled as an independent study.

Please email Erik if you are interested in this position.

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## GAME RESEARCH

### **Interactive Learning Principles (Research Assistant / Designer)**

Erik Harpstead / OH!Lab / LearnLab  
Contact Erik Harpstead ([harpstead@cmu.edu](mailto:harpstead@cmu.edu))

One or more research assistants / designers needed to extend a project making learning science principles more interactive and usable by educational game designers. The

project to date has created a portal presenting an existing list of 30 learning science principles as an ideation deck ([www.edugames.design/principles](http://www.edugames.design/principles)). The goal of this semester will be to iterate on the content of the site and extend it with a series of small interactive experiences / games that illustrate each principle in action.

We are looking for someone with some prior experience in interactive design and prototyping. Previous experience working with React would be preferable. Prior experience (taking classes, doing projects, etc.) with learning science principles is not required but may be helpful.

This opportunity can only be filled as an independent study.

Please email Erik if you are interested in this position.

## GAME RESEARCH

### **Sleepy Games (Research Assistants)**

HCI Research/Independent Study  
Fall 2019  
Jessica Hammer / OH!Lab  
Contact: Adela Kapuścińska (akapusci@alumni.cmu.edu)

The Sleepy Games' Project focuses on designing, playtesting and researching games that transform player behavior and habits around sleep. This semester we will be sense-making from existing data, writing a research paper based on playtesting data accumulated over the summer, and supporting a team of new designers.

We are looking for research assistants who can flexibly work on this project. Your responsibilities may include: data collection and analysis, sense-making and discussion of themes, audio transcription and assistance in compiling a final report.

There are no specific requirements for this position. What's important is enthusiasm to develop new skills and demonstrated ability to self-manage along deadlines.

This opportunity can be either a paid position or an independent study; please indicate which you are interested in when you contact Adela.

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## GAME RESEARCH

### Conference Experience Design (Designers / Programmers)

Jessica Hammer / OH!Lab  
Contact: Mara Leff (Leff@jhf.org)

We are collaborating with Liffoff PGH, a healthcare innovation conference running in September 2020, to help design the attendee experience. We will create a conference tool that a) showcases the playful design skills of CMU students, b) helps attendees think creatively about the exhibits and talks they attend, c) share feedback on what they see, and optionally d) connect with one another.

In fall 2019, we are looking for a design-and-prototype team to help define *what should be built*, in preparation for production in the spring semester. You will ideate, innovate, and develop a pre-production package for the spring.

We are looking to fill two paid positions. Please apply as a pair; at least one member of the team must be an ETC student. Between you, you should have visual design, technical prototyping, and game/experience design skills. An interest in location-based experiences is a plus.

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## GAMES WITH A PURPOSE / DATA VISION

Title: Explaining AI with Games  
Research Category: Games With a Purpose / Data Visualization

### Description:

We are exploring the design of human computational games to collect explanations of how artificial intelligence makes decisions on complex data. We have built a prototype game that allows players to guess what the AI is "seeing" in an image that it classified. This semester, we plan to deploy our first set of games, evaluate its results, and design new games in this space.

Requirements:

We are looking for technical students with experience building and testing web applications. We are also looking for students interested in game design or playtesting.

We are looking for students who can commit 9 to 12 hours per week to this project over the spring semester. Work can be done either for independent study credit (9 or 12 units).

To apply, please send:

- resume
- a short description of your relevant work and educational experience

Contact person:

Adam Perer <[adamperer@cmu.edu](mailto:adamperer@cmu.edu)>

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## HEALTHCARE / DATA VISION

Title: Interactive Care Pathways

Research Category: Healthcare / Data Visualization

Description:

Our project is developing interactive care pathways that guide doctors in diagnosing and treating patients and that automate the generation of physicians' clinical notes. Care pathways are flow-charts that document what clinicians should do in routine situations where there is a clearly established standard of care, such as when an infant arrives at the emergency department suffering from a persistent fever. This work is being done in collaboration with physicians at UPMC Children's Hospital. Over the fall semester, we want a small team of student research assistants to develop a web app that allows clinicians in the Emergency Department to view and interact with a care pathway while they treat their patient. The web app will collect a log of the clinicians actions and automatically produce a draft of the clinical notes. We have previously prototyped and

assessed a design with clinicians, and this semester, we want to develop a system we can deploy and test.

Requirements:

We are looking for students with experience building and testing web applications. We are looking for students who can commit 9 to 12 hours per week to this project over the spring semester. Work can be done either for pay or for independent study credit (9 or 12 units). To apply, please send:

- resume
- a short description of your relevant work and educational experience
- names of two CMU instructors who can vouch for your ability to work independently

Contact person:

Adam Perer <[adamperer@cmu.edu](mailto:adamperer@cmu.edu)>

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## HEALTHCARE / DATA VISION

Title: Making Medical Predictions Interpretable

Research Category: Healthcare / Data Visualization

**Description:**

We are working with doctors at Allegheny General Hospital who are experts in making predictions about patients with complex diseases. We have designed machine learning models that are also successful as predicting risk of patients. We are interested in

designing visual interfaces to help explain how the machine learning algorithm is making its decision. We have an initial prototype, and we are looking to improve its features and visual design as well as evaluate its effectiveness with clinicians.

**Requirements:**

We are looking for technical students with experience building and testing web applications. Experience with data visualization or machine learning is a plus.

We are looking for students who can commit 9 to 12 hours per week to this project over the spring semester. Work can be done either for independent study credit (9 or 12 units).

To apply, please send:

- resume
- a short description of your relevant work and educational experience

Contact person:

Adam Perer <[adamperer@cmu.edu](mailto:adamperer@cmu.edu)>

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## PROTOTYPING, SENSING, APPLICATIONS OF MACHINE LEARNING

**Project Name:** Wearables and Activity Recognition

**Mentor:** Mayank Goel

**Category Keywords:** Prototyping, Sensing, Applications of Machine Learning

**Project Description:**

A user's activities and behavior have a strong relationship with their overall health, productivity, and the way they interact with technology. Something as simple as a rough estimate of a person's step count can tell us if they suffer from any depressive symptoms or have anxiety bouts.

We are exploring what new capabilities can be unlocked if we go beyond simple geographical locations and step counts. We are developing systems that can help us understand a user's diet better, how they exercise, their daily indoor activities, driving behaviors, etc.

We are looking for students to contribute to various aspects of these efforts. Depending on their interest, the students can help in building and prototyping the hardware device, or they can contribute to the signal processing and machine learning component. Interested students will also have the option of collecting the data, annotating the data, and also contributing to the manuscript of the project.

**Tools/Skills involved (you can work with a subset of these):**

1. Design
2. 3D printing
3. Embedded Computing
4. Sensing



## PROTOTYPING, SENSING, APPLICATIONS OF MACHINE LEARNING

**Project Name:** Interacting with a watch using Augmented Reality

**Mentor:** Mayank Goel

## PROTOTYPING, SENSING, APPLICATIONS OF MACHINE LEARNING

**Project Name:** Interacting with a watch using Augmented Reality

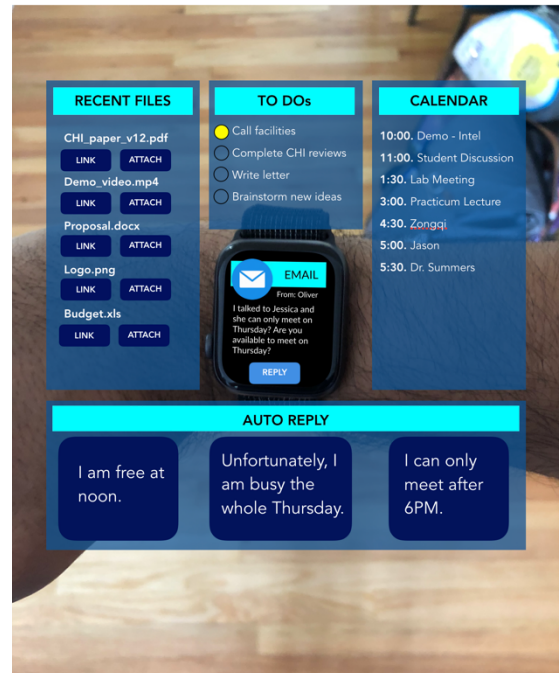
**Mentor:** Mayank Goel

**Category Keywords:** Prototyping, Sensing, Applications of Machine Learning

### Description:

Users use their computing devices in a myriad of contexts and environments. However, in most cases, the devices are not aware of the changing environments, and the use of technology stops being fun, convenient, and more importantly, safe. One example is a smartwatch. It is on the user the whole time, but has a tiny screen and requires the users to keep their hands propped for too long.

To solve some of the challenges associated with a watch, researchers have appropriated the human body and projected information to increase the output area. However, the area can be increased further by not limiting ourselves to the skin. Increasing prevalence of AR headsets is particularly exciting here. We are exploring the possibility to combine the smartwatch screen with the information projected on an AR headset. (see figure). The watch provides an explicit intent by the user to interact because they will lift their hand to see the watch when they want to interact. The sensors on the watch can continue to detect some of the gestures (e.g., motion, touch). The user can also interact with the information using speech, in-air gestures sensed by the AR headset, or gestures on the headset's surface (e.g., Google Glass).



**Figure 4.** Augmenting a smartwatch's display with an overlay from the AR headset.

I am looking for an awesome set of students to:

1. Build an interactive system that combines the displays of a watch and an AR headset
2. Develop new, useful interactions

3. Evaluate the usability and utility of some of the ideas.

This is a new project for our group, and you can contribute to any part of the project that interests you.

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## RESEARCH

### **Wanted: Research Assistants to help with Teacher Dashboard Project: ClassInSight - Vista Schools Professor John Zimmerman**

Our project is developing a dashboard that shows teachers a summary of their own teaching behaviors so they can reflect on and improve their teaching. This is sort of like a FitBit for teachers.

This fall we will be capturing data from high school science classrooms in San Diego. We are looking for research assistants that can help:

- **design data visualizations** around classroom activities and around the effective use of discussion in science teaching.
- **implement** these visualizations **in javascript (D3 or P5)**
- help **design and execute an assessment**, where we show teachers their own data and see how they make sense of it
- collaborate with our research partners in San Diego who will be collecting and coding the classroom data.

We are looking for students with experience (or at least interest) in any of the following:

- Interface design
- Information design
- Information visualization
- User studies
- Web development
- Learning science

We need students who can commit 9 to 12 hours per week to this project over the fall semester. **Work can be done either for pay or for independent study credit (9 or 12 units).**

If you are interested, please send the following to Kiemute Oyibo <[koyibo@andrew.cmu.edu](mailto:koyibo@andrew.cmu.edu)>

- resume
- a short description of your relevant work and/or educational experience

In addition, please go to LINK (<https://doodle.com/poll/pesx3qrbac87ny5e>) and indicate the times you are free each week for a team meeting.

## RESEARCH

Wanted: Research Assistants to help with systematic review of HCI literature  
Project: Examining the Evolution of HCI terminology and practice

The aim of this project is to examine how meanings of terms common in the HCI vernacular such as “user,” “affordance,” and “deployment” have shifted over time, and how those shifts might be reflective of changes in research practice within the field.

We are recruiting a team of undergraduate or graduate student research assistants for the Fall Semester to assist with a systematic review of HCI literature using a set of academic journals, conference publications, and relevant trade press. We are looking for research assistants that can help:

- Compile a comprehensive set of articles for analysis
- Extract relevant data from the set of papers
- Conduct qualitative thematic analysis
- Synthesize their findings in writing

We are looking for students with experience (or strong interest) in:

- Examining the history of the field of HCI
- Conducting a systematic literature review
- Using inductive techniques of data analysis

We are looking for students who can commit 9 to 12 hours per week to this project over the fall semester. Work can be done for independent study credit (9 or 12 units).

If you are interested, please send the following to Dr. Sarah Fox <[sarahfox@cmu.edu](mailto:sarahfox@cmu.edu)>

- resume
- a short description of your relevant work and educational experience

In addition, please complete the following poll with times you are free each week for a team meeting:  
<https://doodle.com/poll/cqf2duxe5y2xhps5>

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## PRIVACY AND SECURITY, SMARTPHONES

Designing User Interfaces for Privacy-Enhanced Android  
Category: Privacy and Security, Smartphones  
Contact: Jason Hong ([jasonh@cs.cmu.edu](mailto:jasonh@cs.cmu.edu))

The goal of the Brandeis project is to make it vastly easier for developers and end-users to manage privacy in the context of sensor-based smartphone apps. We are looking for students to help with the design of user interfaces to help people understand what data an app might collect about them, specify privacy policies, and check that everything is ok. Expecting students to average at least 10 hours a week on this research, for pay or independent study. Send resume, GPA in primary major(s), and links to any relevant projects.

Ideal Skills: Visual design, UX design. Experience with privacy, security, Android, and/or Figma is a plus.

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### **PRIVACY AND SECURITY, SMARTPHONES**

Analyzing Privacy Behaviors of Android Apps  
Category: Privacy and Security, Smartphones  
Contact: Jason Hong (jasonh@cs.cmu.edu)

The goal of the Brandeis project is to make it vastly easier for developers and end-users to manage privacy in the context of sensor-based smartphone apps. We are looking for students to help analyze what permissions an app is requesting and compare that against what data the app actually needs. For example, weather apps only need what city you are in, but many still request exact GPS data. Our goal here is to document a large number of these mismatches, demonstrate that our new programming model (PrivacyStreams) can address this problem, and then share this data with folks at Google to help convince them to adopt our ideas. Expecting students to average at least 10 hours a week on this research, for pay or independent study. Send resume, GPA in primary major(s), and links to any relevant projects.

Ideal Skills: Experience with privacy, security, Java, Android, and any form of static or dynamic analysis is a plus.

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### **PRIVACY AND SECURITY, SMARTPHONES**

Static Analysis of Libraries in Android Apps  
Category: Privacy and Security, Smartphones  
Contact: Jason Hong (jasonh@cs.cmu.edu)

The goal of the Brandeis project is to make it vastly easier for developers and end-users to manage privacy in the context of sensor-based smartphone apps. We are looking for students to develop some software to statically analyze what third-party libraries an app uses, as one step in generating a privacy policy that describes what data the app uses and why. Expecting students to average at least 10 hours a week on this research, for pay or

independent study. Send resume, GPA in primary major(s), and links to any relevant projects.

Ideal Skills: Experience with privacy and security, a lot of experience with Android development and/or static analysis

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## **PRIVACY AND SECURITY, SMARTPHONES**

Coconut IDE Plugin to Help Developers with Privacy

Category: Privacy and Security, Smartphones

Contact: Tianshi Li (tianshil@andrew.cmu.edu)

This project lies at the intersection of HCI, privacy, and software engineering. Coconut is a plugin for Android Studio that offers developers feedback about how to improve privacy in their apps. Some example features include offering alternative APIs, quick fixes, viewing all of the sensitive data used in an app in a single place, and generating privacy policies. We are looking for students to help build out more features, in preparation for open sourcing the work and deploying it for a field study. Expecting students to average at least 10 hours a week on this research, for pay or independent study. Send resume, GPA in primary major(s), and links to any relevant projects.

Ideal qualifications: Genuine interest in privacy and HCI research, prior experience with Android programming, prior experience with software analysis, independent and strong problem-solving skills, reliable, self-motivated, quick learner

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## **PRIVACY AND SECURITY, IoT**

IoT Hub for Privacy and Security

Category: Privacy and Security, IoT

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

The Internet of Things is coming. How can we protect everyday people from all of the likely privacy and security risks? We're investigating how centralized hubs can help offer new kinds of services that can help with privacy, security, and management of lots of devices. Examples include checking for software updates for devices, easy ways of blocking unexpected network traffic, and simple kinds of end-user

programming to connect devices together. We're looking for UX designers as well as software developers. Expecting students to average about 10 hours a week on this research (more is fine), for pay or independent study. Send resume, GPA in primary major(s), and links to any relevant projects.

Ideal Skills: Some subset of Android programming, Linux, web programming, databases, UX design, networking

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## **PRIVACY AND SECURITY, USER INTERFACES, USER STUDIES**

Safesea Browser Plugin for Helping with Facebook Privacy Settings

Categories: Privacy and Security, User Interfaces, User Studies

Contact: Cori Faklaris (cfaklari@andrew.cmu.edu)

The goal of this project is to build a browser plugin that nudge people towards examining their Facebook privacy settings, by showing people what others think the settings should be. We are looking for one or more students who are interested in interaction design and web programming (front-end or back-end), as well as user studies of our plugin. Familiarity with (or interest in learning) Python or Ruby a plus. Javascript also a plus. Expecting students to average about 10 hours a week on this research (more is fine), for pay or independent study. Send resume, GPA in primary major(s), and links to any relevant projects.

Ideal Skills: Python, Ruby, Javascript, web programming, conducting user studies

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## **PRIVACY AND SECURITY, USER INTERFACES, USER STUDIES**

Interviews of IT Professionals about Work Teams

Categories: Privacy and Security, User Interfaces, User Studies

Contact: Cori Faklaris (cfaklari@andrew.cmu.edu)

We are looking for someone to help with organizing and conducting interviews with information technology professionals about work teams, in the context of how they manage cybersecurity. Tasks include identifying and recruiting interviewees, conducting and recording the resulting interviews, and analyzing the collected data. We are looking for students who can speak IT (somewhat familiar with jargon and technical concepts) and who have familiarity with

(or an interest in developing skills in) conducting interviews for research. Students in a non-technical program such as psychology or liberal arts are encouraged to apply. Interested students should send their resume, major GPA, and links to any relevant projects to cfaklari@andrew.cmu.edu.

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## **PRIVACY, CROWDSOURCING, USABILITY ENGINEERING**

PrivacyIO: Discovering Privacy Concerns using the Crowd

Research category: Privacy, crowdsourcing, usability engineering

Contact: Haojian Jin (haojian@cs.cmu.edu)

Today, it is easy for companies to collect a great deal of data about people, but hard to understand what are appropriate uses of that data. The current state of the art is for experts to review data practices. We are developing a technique to harness the power of crowds to help assess the range and the magnitude of privacy concerns people have about a given data practice. We are looking for two research assistants to help us validate our technique. Tasks will include a) generating storyboards using a system we have developed; b) scheduling study participants and running user studies. You will learn the state of arts privacy measuring technique from a UX perspective. Expecting students to average at least 10 hours a week on this research, for pay or independent study. Send resume, GPA in primary major(s), and links to any relevant projects. Send resume, GPA in primary major(s), and links to any relevant projects.

Ideal Qualifications: Genuine interest in HCI or privacy research, attention to detail, strong organizational skills, reliable, self-motivated, experience with conducting lab studies. Knowledge about usability techniques (e.g., storyboarding, heuristic evaluation) is a big plus.

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## **PRIVACY, AI, CROWDSOURCING, BIAS**

Bias Bounty for Identifying Bias in Machine Learning

Research category: AI, crowdsourcing, bias

Contact: Hong Shen (hongs@andrew.cmu.edu)

In cybersecurity, bug bounties are used to reward hackers for finding

vulnerabilities in software. We want to adapt this idea for finding bias in machine learning models. Developers might upload a ML model to our server, and we organize crowd workers to help identify potential problems. These crowd workers might include testers, who find instances of failures, as well as hypothesizers, who look at the overall results and come up with conjectures as to where the ML model is failing. We are looking for students to help build out the initial infrastructure as well as initial test cases using face recognition. Expecting students to average at least 10 hours a week on this research, for pay or independent study. Send resume, GPA in primary major(s), and links to any relevant projects. Send resume, GPA in primary major(s), and links to any relevant projects.

Ideal Qualifications: Databases, web programming, basics of AI and ML, visualization

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## **SOCIAL RESEARCH**

### **CARE (Coping After Racist Experiences) Project (Research Assistant)**

Jessica Hammer / OH!Lab

Contact: Alexandra To (aato@cs.cmu.edu)

The CARE project examines how uncertainty impacts the emotional experience of racism. This semester we will be finalizing and running an online vignette study, planning participatory design workshops, and writing a research paper.

We are looking for research assistants who can flexibly work on this project. The primary need is for assistance in running an online study which will include writing copy, collecting and organizing data, and discussion of themes.

There are no specific requirements for this position - more important is enthusiasm to develop new skills.

This opportunity must be filled as an independent study.

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## **SOCIAL RESEARCH**

### **CARE (Coping After Racist Experiences) Project (Designer / Participatory Design)**

Jessica Hammer / OH!Lab

Contact: Alexandra To (aato@cs.cmu.edu)

The CARE project examines how uncertainty impacts the emotional experience of racism. This semester we will be finalizing and running an online vignette study, planning participatory design workshops, and writing a research paper.



HCI Research/Independent Study

Fall 2019

We are looking for someone with a background in design who can assist in organizing and developing ideas for design probes and interventions, as well as help in the planning for participatory design workshops.

A background in design is recommended, but not required - more important is enthusiasm to develop new skills and demonstrated ability to self-manage along deadlines.

This opportunity must be filled as an independent study.

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## **SOCIAL RESEARCH**

### **Social Cybersecurity (Research assistant / programmer)**

Laura Dabbish / CoEx Lab, Jessica Hammer / OH!Lab

Contact: Tianying Chen (tianyinc@andrew.cmu.edu)

The social cybersecurity project revolves around investigating people's cybersecurity project through a lens of social psychology theory. This semester we are running a study to examine the effectiveness of the game prototype that we developed.

We are looking for someone with a background in programming (Unity and web programming specifically) who can assist in tweaking the prototype and make alternative versions of the game. Your responsibility also may involve making interactive prototypes in a web browser.

A background in programming, specifically Unity and web programming is required.

This opportunity can be filled as an independent study or paid position.

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## **SOCIAL RESEARCH**

### **Social Support from Strong and Weak Ties During Crisis (Research assistant)**

Tianying Chen, Laura Dabbish, Robert Kraut, CoEx Lab / OH!Lab

Contact: Tianying Chen (tianyinc@andrew.cmu.edu)

This project investigates the difference between support received from strong and weak social connection during crisis. This semester we are running a study to examine what are the key reasons that would prompt people to disclose sensitive information and seek support during crisis to different social ties.

We are looking for someone with a passion for research who would be interested in learning about different aspects of research. The responsibilities of this position would involve a large amount of reading and literature review. Students working on this project will also have opportunities to participate in writing of the manuscript. Students will have weekly meetings to discuss any questions they might have for personal growth as a future researcher.

No specific background is required. However, students who are interested should make sure to have appropriate reading and summarizing skills, preferable with past research experience.

This position must be filled as independent study.

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## **SOCIAL RESEARCH**

### **Upcycled Home (Qualitative/Quantitative Data Analysis)**

Kristin Williams / OH!Lab / DevLab  
Contact: Kristin Williams (krismawil@cs.cmu.edu)

Upcycling domestic objects could offer households greater discretion and control over these IoT costs by supporting tailoring to the home. We will analyze data collected over a 7 day study to characterize upcycling needs/opportunities in the home.

You will help with data analysis and paper writing

You should have completed your first year of college. Experience with quantitative, qualitative, or both forms of data analysis is a plus.

This position is available as an independent study.

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## **TECHNICAL RESEARCH**

### **EUP COMPOSITION FRAMEWORK (Research Assistant)**

Kristin Williams / OH!Lab / DevLab  
Contact: krismawil@cs.cmu.edu

We will conduct a meta-review of research papers to develop a framework for end user programming that includes tangible user interfaces.

We will sample and characterize a dataset representing the state of the art research on end user programming. We will describe and analyze missing dimensions of EUP research that are important for tangible interfaces.

Your responsibilities will be data collection and analysis. You will identify and obtain relevant papers, then categorize/analyze them.

Strong organizational skills are required, specifically the ability to document work accomplished and to manage a large dataset. Strong analytical skills are a plus.

This opportunity can be filled as an independent study.

Please email Kristin if you are interested in the position.

Updated 10sept2019

