

# Joining the HCI Group at UCLA!

**📣📣📣 Currently accepting applications for 2019 Fall/Winter internships! 📣📣📣**

HCI is an interdisciplinary research area that is a perfect arena for you to experience solving interesting problems between users and computing systems. There are two ways to get involved: taking on an expedition project or working as a specialist. **Please read carefully about the difference between these two roles and email me ([xac@ucla.edu](mailto:xac@ucla.edu)) your latest CV, transcript and which specialist role or expedition project you are interested in.**

	<b>Expedition</b> 🚢	<b>Specialists</b> 🧑🏠
<i>What</i>	Exploring a new research project by discovering whether a topic is promising, what is interesting and challenging, and laying the groundwork for future development.	Taking on specific roles in an existing research project by programming, building hardware, designing user interfaces, running user study, etc.
<i>Timeframe</i>	Short: 1 quarter.	Long: 2-4 quarters.
<i>Weekly hours</i>	Fairly fixed: 5-10.	Highly variable: 0-50.
<i>Teamwork</i>	Quite independent: one to two members.	Quite dependent: closely with multiple other members.
<i>Type of work</i>	Open-ended activities, e.g., hacking some technology to implement the idea, collecting/analyzing initial sensor data, running formative user study, sketching system designs.	Well-defined tasks that depend on specific ongoing projects that might need your role.
<i>Pros</i>	You get to explore an exciting new topic that interests you in almost unlimited ways.	You get to hone your special skill by learning and applying it to a publication-driven project that often results in a research paper.
<i>Cons</i>	Some topics might be inherently hard; you might run into dead ends or get lost in the process.	You have to do high caliber work, which could be very demanding and time-consuming.

# Specialists

Below are the current opening for specialists:

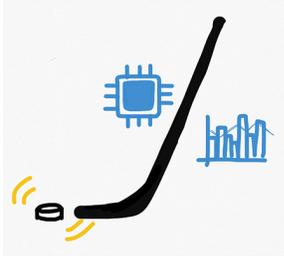
- **Software prototyper.** Your main task is to program specific software components of an interactive system, ranging from front- to back- ends. Our usual programming languages include HTML/CSS/JavaScript, Python, Java; it is also possible to use another language of your choice;
- **Hardware prototyper.** Your main task is to design and build custom circuits that often involve both sensors and actuators. Such a prototype often has to be compact, wearable and able to detect novel user input (e.g., motion gestures, facial expression). If you like tinkering with hardware and have built your own PCB or any custom gadgets, you will feel comfortable with this role;
- **Domain specialist.** You should have practical knowledge of the following domains and be able to pragmatically implement algorithms or end-to-end systems to solve specific problems:
  - Machine learning/deep learning
  - Computer vision
  - Natural language processing

If you do extremely well in one of the above undergrad/grad courses, it is often an indication that you are already a domain specialist.

- **User experience designer.** Your main task is to come up with visual and interaction design of a system's interface that encompasses the entire workflow of a user accomplishing various tasks using the systems;
- **User researcher.** Your main task is to design, plan and run user studies to elicit users' behavior and preference, to interview potential users, or to evaluate a prototype system's usability;
- **Data analyst.** Your main task is to qualitatively or quantitatively analyze and distill insight from user data (e.g., performance log when interacting with a prototype system, readings from wearable sensors);
- **Artist.** Your main task is to enhance the aesthetic aspect of a project, ranging from making an interface's visual elements prettier to creating illustrations for a research paper;
- **Facility manager.** Your job is to improve how we organize our lab facility, e.g., electronics, equipment, workshop, open desk area, etc.

# Expedition

Below is a list of current expedition topics (you are also welcome to come with your own ideas):



## Data-Driven Ice Hockey

Ice hockey is a fast-paced, highly dynamic and highly uncertain sports. How can we use data to inform better game-time decision, to answer coaches and players' questions, to create better statistic summaries that reveal insights hidden in the shots, checks, hits, and penalties? You will explore possibilities of introducing a more data-driven approach to analyze, understand and represent ice hockey.



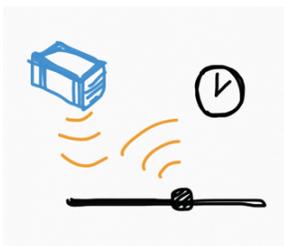
## Augmented Reality Audio

What if we can augment what we hear? A wood stick can easily become a lightsaber. A plush toy can speak to you as you squeeze it. Maybe people will walk more quietly if they hear their own amplified footsteps? In this project you will explore sensing and audio generation techniques to augment what people hear in various scenarios when interacting with various kinds of objects.



## Cross-reality interaction

In the future, we will gradually transition from poking pixels on the screen to interacting with objects manifested in the real world. For example, you can let Mickey jump off from your phone's screen to the physical world. Then you can talk to him, gesture at him, and watch him walking on your desk or sitting on your chair. You will explore technical solutions to realize such cross-reality interaction to create a fun and novel experience.



## Data-deprived user interfaces

Interactive systems with complex backends and networking latency tend to produce delayed and unresponsive user experiences, because the UI is untimely "data-deprived". Without the arrival of data in time, how can we maintain the same level of experiences to minimize how much the data deprivation will affect the user? You will study and explore novel methods to tackle this problem as well as testing them in a range of usage scenarios.



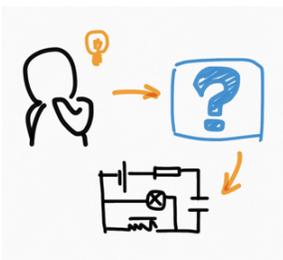
### **A spreadsheet interface for 3D modeling**

3D modeling often involves handling complex spatial relationships and constraints amongst different geometric components. A similarly challenging problem is handling numeric data, which has been well addressed in spreadsheets. Can we leverage users' familiarity with spreadsheets to enhance their capability of handling 3D models? You will build a spreadsheet-3D modeling hybrid interface to explore this question.



### **Natural language and gesture as a design tool**

Existing 3D design tools mostly rely on mouse, keyboard, and screen; in contrast, humans communicate ideas in much richer ways, e.g., natural language and gesture. Can we introduce natural language and gesture to the existing 3D design environment? You will explore the design of such tools and implement working prototypes to demonstrate its expressiveness.



### **Better design, development & debugging tools for electrical engineers**

How do electrical engineers like the existing tools they use? What are the main pain points? How can we design better tools for them? You will explore these questions taking a design-centric approach, and prototype your tool ideas to support electrical engineers' design, development, and debugging process.