AR/VR Usability Testing — This student will work with UMSI professor Michael Nebeling in the Information Interaction Lab where they are investigating how multiple different types of devices can be combined and used in interesting ways to provide new interaction possibilities and enable tasks that are difficult to do using any of the devices alone. The project will focus on translating traditional methods and principles from user study design and usability testing to AR/VR usability. Depending on their interests, a student could help with the development of new tools to support such studies, the design and evaluation of new kinds of AR/VR interfaces with a particular focus on usability testing, or both.

2019 Summer Research Opportunities in AR/VR Usability Testing with Professor Michael Nebeling in the Information Interaction Lab at UMSI:

Projects with Professor Nebeling investigate new techniques, tools and technologies that enable users to interact with information in more natural and powerful ways, and also make it easier for designers to create more usable and effective interfaces. Ultimately, our research will allow more users to become designers. This particular summer project can involve the development of new tools to support such studies, the design and evaluation of new kinds of AR/VR interfaces with a particular focus on usability testing, or both.

There is a wide range of new kinds of AR/VR devices and, at the moment, it is very difficult for non-programmers to design for these technologies. A recent tool developed in the lab of Professor Nebeling, and presented at CHI 2018, is ProtoAR (a pre-print of the paper is available on request). ProtoAR was created specifically for interaction designers. There are two key innovations in ProtoAR: (1) cross-device multi-layer authoring tools for live editing of mobile AR apps on phones; (2) interactive capture tools to generate mobile screens or AR overlays from paper sketches, and 3D models from Play-Doh. This arguably lowers the barrier of entry and enables users to become designers. Interaction designers are used to working with tools such as InVision, Proto.io, and Adobe Experience Design. These enable them to rapidly create prototypes, in particular, of mobile interfaces, and iterate their design concept. ProtoAR aims to fill the gap between these tools and tools more focused on AR/VR interface development such as Unity which require significant technical skill.

Based on the concepts in ProtoAR and other work going on in Professor Nebeling’s lab, the team is currently working on turning the lab space into a creative space for AR/VR design and testing. They currently think of it as “the holodeck for designers”, and are working hard on new tools and techniques to support usability testing. What would a future AR/VR usability lab look like? What kind of information would need to be collected, visualized, and analyzed, to capture user studies and make sense of the kinds of things study facilitators observe. What are “good metrics” to assess the usability of an AR/VR interface? How can AR and VR play together to enable remote usability testing? A careful selection of these bigger questions will drive the collaboration and joint research on this project.

Skills required:

Experience shows that students with a more technical background such as Computer Science do very well when working with other lab members. Students will benefit a lot from previous programming experience—either acquired through coursework or, ideally, through projects—with web technologies such as HTML5/CSS3, JavaScript/jQuery, and Node.js. The more students are familiar with Unity and C# for various AR/VR devices the better, but this project will also provide an opportunity to learn and experiment with some of these technologies. The focus of the project will be determined based on student interest and experience, and can range from more technical development to more user research oriented angles.

About Professor Michael Nebeling:

I joined UMSI as an Assistant Professor in 2016, after completing a postdoc in the Human-Computer Interaction Institute at Carnegie Mellon University, and a PhD in Computer Science at ETH Zurich. I’m looking for people who share my vision and interests in designing, building, and studying novel user interfaces, powered not only by technology, but also by people. Currently, our focus is on augmented and mixed reality interfaces involving natural user interactions using gesture and speech. If you are interested in working with me, please email me at nebeling@umich.edu. You can also find out more about me and my work at
http://michael-nebeling.de. More information about recent student activities and research opportunities in my Information Interaction Lab can be found at https://www.mi2lab.com. I worked closely together with last year’s REMS student and this was a very successful project and experience for both the student and me, which also resulted in a paper that was presented by the student at CHI 2018.