# UCF DEPARTMENT OF COMPUTER SCIENCE

# Spring 2016 Seminar Series

## WHY ARE PENS SO TERRIBLE? DECONSTRUCTING AND UNDERSTANDING THE STYLUS ECOSYSTEM AND USER EXPERIENCE TODAY

### FRIDAY MARCH 4, 2016 ● 10:00 AM – HEC 450

Although pens and paper are pervasive in the analog world, their digital counterparts, styli and tablets, have yet to achieve the same adoption or frequency of use. My talk identifies and deconstructs the factors that influence the experiences that users have with the digital stylus ecosystem, so as to build a foundational understanding of pen-based interaction today. I will first detail an exploratory study that compared traditional pen and paper to tablets and styli, and highlight the significant impact latency, unintended touch, and stylus accuracy have on the user experience. I will then dive deeper into each of these factors, initially presenting results from the first psychophysical experiments that used a high-performance low-latency system (i.e., a display with 1 millisecond of latency) and a resultant generalized framework that depicts our understanding of the latency perception process to date. I will then detail a data collection study that captured raw touch and stylus digitizer data and motion capture information from users while they were inking, and present the results of my investigation of novel and existing solutions to overcome unintended touch. Next, I will present two user studies that explored stylus accuracy and found that it is not one's ability to rest their hand on the screen that influences their inking and the selection of targets, but rather the presence of visual feedback and the dimensions of the stylus' nib. I will then conclude with my vision for the future of pen-based computing, both on and off the tablet screen, and present recent work I have been undertaking to understand and support the next generation of making, prototyping, and fabrication.

## DR. MICHELLE ANNETT
### University of Toronto



Dr. Michelle Annett is a Human Computer Interaction researcher from Edmonton, Alberta, Canada. She earned her BSc, MSc, and PhD in Computer Science from the University of Alberta, with her graduate degrees supervised by Dr. Walter F. Bischof. Her research is broadly focused on how input and interaction techniques can enhance the lives of everyday users. During her Master's program, Dr. Annett investigated the application of virtual reality techniques to spatial navigation paradigms for psychologists. In the beginning of her PhD program, Dr. Annett explored how multi-touch devices could be integrated into occupational and physical therapy programs, in addition to the acquisition, retention, and transfer of skills on multi-touch devices. In 2011, Dr. Annett was a graduate research intern in the User Interface Group at Autodesk Research in Toronto, Ontario, and from 2012-2013, she was a visiting researcher at Microsoft Research in Redmond, Washington. While at Microsoft Research, she worked with project managers, manufacturers, and researchers on issues related to pen-based computing. The results of this work comprised her doctoral thesis, The Fundamental Issues of Pen-Based Interaction on Tablet Devices, which was awarded the University of Alberta's Faculty of Science Doctoral Dissertation Award and the 2014 Bill Buxton Dissertation Award. Dr. Annett is presently an NSERC Postdoctoral Fellow, holding at joint appointment in the DGP Lab at the University of Toronto with Dr. Daniel Wigdor, and in the User Interface Group at Autodesk Research with Dr. Tovi Grossman and Dr. George Fitzmaurice. She is currently investigating skill retention and transfer, as well as the next-generation of fabrication, prototyping, and making processes.

Outside her research interests, Dr. Annett devotes time to STEM-based activities that dispel perceptions and stereotypes regarding Computing Science. Her contributions towards STEM advocacy have been recognized by the University of Alberta, the Government of Alberta, L'Oreal-UNESCO for Women in Science, and Google. Dr. Annett also collects Disney Vinylmations, building LEGO Architecture, and is an avid cross-stitcher!

*Hosted by: Dr. Mark Heinrich*

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