Hand occlusion with direct pen input

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RESUME

The talk will be based on two papers recently presented at the ACM SIGCHI conference.

Hand occlusion with tablet-sized direct pen input [1]

We present results from an experiment examining the area occluded by the hand when using a tablet-sized direct pen input device. Our results show that the pen, hand, and forearm can occlude up to 47% of a 12 inch display. The shape of the occluded area varies between participants due to differences in pen grip rather than simply anatomical differences. For the most part, individuals adopt a consistent posture for long and short selection tasks. Overall, many occluded pixels are located higher relative to the pen than previously thought. From the experimental data, a five-parameter scalable circle and pivoting rectangle geometric model is presented which captures the general shape of the occluded area relative to the pen position. This model fits the experimental data much better than the simple bounding box model often used implicitly by designers. The space of fitted parameters also serves to quantify the shape of occlusion. Finally, an initial design for a predictive version of the model is discussed.

Occlusion-Aware Interfaces [2]

We define occlusion-aware interfaces as interaction techniques which know what area of the display is currently occluded, and use this knowledge to counteract potential problems and/or utilize the hidden area. As a case study, we describe the Occlusion-Aware Viewer, which identifies important regions hidden beneath the hand and displays them in a non-occluded area using a bubble-like callout. To determine what is important, we use an application agnostic image processing layer. For the occluded area, we use a user configurable, real-time version of our previously published geometric model. In an evaluation with a simultaneous monitoring task, we find the technique can successfully mitigate the effects of occlusion, although issues with ambiguity and stability suggest further refinements. Finally, we present designs for three other occlusion-aware techniques for pop-ups, dragging, and a hidden widget.

BIOGRAPHIE

Daniel Vogel recently completed his PhD in Computer Science specializing in Human Computer Interaction at the University of Toronto. His research interests include interaction with large displays, ambient displays, and tablets. Before returning to graduate school, Dan worked for almost ten years as a computer animator, graphic designer, information architect and interaction design consultant for clients such as AutoDesk Press, Starbucks, Sony, and the Royal Bank of Canada. He received a BA in Computer Science and Visual Arts from the University of Western Ontario and a BFA in Intermedia Studies from the Emily Carr Institute of Art and Design in Vancouver, Canada.

BIBLIOGRAPHIE

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2. Daniel Vogel and Ravin Balakrishnan. Occlusion-aware interfaces. In *CHI '10: Proceedings of the 28th international conference on Human factors in computing systems*, pages 263–272, New York, NY, USA, 2010. ACM.