CSC318 TUX Talk Alternative

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I. SPEAKER: DANIEL VOGEL

Professor Daniel Vogel is an assistant professor who specializes in Human-Computer Interaction at the University of Waterloo. He finished his undergraduate studies at the University of Western Ontario, where he was on the Dean's Honour List. He then proceeded to complete his MSc and PhD from the University of Toronto. He also holds a BFA from the Emily Carr University of Art + Design. In addition to teaching and doing research, he has also worked for over ten years as a computer animator, graphic designer and interaction design consultant for well-known organizations like Sony, Starbucks and the Royal Bank of Canada, among many others. Not only this, he was also an artist in residence in the Banff Centre and his work is renowned internationally. He has received several awards, some of which are the Bill Buxton Dissertation Award for best Canadian doctoral dissertation in human-computer interaction and the Best Paper Award for his paper on multi-touch command selection using finger identification.

II. TOP THREE PAPERS

Professor Vogel's most cited paper, which has been cited 588 times, is called "Interactive Public Ambient Displays: Transitioning from Implicit to Explicit, Public to Personal, Interaction with Multiple Users". This paper addresses the issue of securing private interaction with a public ambient display without sacrificing the feature of public interaction. It can be difficult for users to trust a display located in a public setting, making it difficult for personal interaction to take place. To address this problem, this paper calls for a single display to have several design characteristics that makes this interaction possible. The display needs to have calm aesthetics, immediate usability, the capacity for shared use, the ability to combine public and personal information and of course, privacy. The authors aim to enable private interaction by having the display sense contextual cues like proximity of the user to the display, while public interaction is enabled with the help of hand gestures and touch screen input. They tested this system using informal user evaluations, which were somewhat successful. While the participants had no trouble understanding that their hand gestures and body position were to control the kind of interaction they would have with the display, they had some difficulty actually performing the hand gestures that were required. Overall, this idea has potential if feedback is incorporated when the hand gestures are not performed correctly, so that users can understand how it should be done.

His paper titled "Shift: a technique for operating pen-based interfaces using touch" has been cited 392 times. The authors address the problem of increased targeting times and error rates when touch input is used. The reason for these problems is that it is hard to point one's finger at the target when it is smaller than the fingertip, because the selection point is covered by the fingertip. The proposed solution is to use a pointing technique called Shift, which shows the area underneath the fingertip in a separate callout above the finger, so that users knows

exactly what they have selected. In this way, users can easily guide this pointer in the direction of the target and can lift their finger when the target has been selected. Participants were asked to evaluate Shift, regular touch and Offset Cursor (a technique that creates the pointer a distance away from the finger's contact point, so that it is easy to see the selected area). It was predicted that Shift would outperform Offset Cursor, which would outperform touch and this is exactly what the results indicated. In conclusion, Shift proved to be an excellent technique to overcome the occlusion problem that was explored in this paper.

His paper titled "Distant freehand pointing and clicking on very large, high resolution displays' has been cited 370 times. As the distance between the display and user increases, it becomes impossible for interaction to take place unless there is a physical input device that facilitates it, for instance, a laser pointer. This can be problematic if one does not have access to such a device or if it gets misplaced. The proposed solution to this problem is to use the human hand to perform this task and mimic the "point and click" user interface. Two techniques were designed to simulate the "clicking". These are the AirTap, which is similar to moving the index finger to click a mouse button or tap a touch screen, and the ThumbTrigger, where the thumb is moved in and out towards the index finger. The three "pointing" techniques designed were RayCasting, which emanates a ray from the index finger, a Relative Pointing with Clutching technique, which uses an open hand for cursor control and a clenched fist for clutching, and Hybrid RaytoRelative pointing, which is essentially the same as the second technique but it uses RayCasting to perform the clutching motion instead. Twelve participants were selected to test each of the pointing techniques in a within-participant experimental design. Results indicated that the Hybrid RaytoRelative and Relative Pointing with Clutching were preferred. In conclusion, these techniques proved to be useful and an effective solution to the problem that is being explored.

III. CURRENT WORK

Professor Daniel Vogel's research is primarily based on making the human-computer interaction experience as enjoyable as possible for users. He prefers using hand and body gestures to perform the same tasks that a physical input device would perform in an effort to simplify the interaction. He seems to have diversified his range to explore other body parts in his recent works. In the top three cited papers, we see an abundance of hand gestures to interact with a display. In his recent works, however, he explores foot interaction for a standing desk (2016, June) and the possibility of illustrating human movements of the entire body (2016, October). The latter uses a technique called DemoDraw to create these illustrations as a result of the user physically demonstrating the movements in an iterative manner. In addition to this, he also critiques the touch input implicit authentication's ability to protect the user against shoulder surfing and offline training attacks, deeming it unsafe for users in his paper called "Targeted Mimicry Attacks on Touch Input Based Implicit Authentication Schemes". We also see him use finger identification to enable command selection and parameter manipulation, using a technique called FingerCuts (2017) and dive into next-point prediction metrics to reduce the lag between user input and visual interface feedback (2016, October).

IV. REFERENCES

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