Implicit User Interfaces

Abstract: Implicit user interfaces obtain information from their users passively, typically in addition to mouse, keyboard, or other explicit inputs. They fit into the emerging trends of physiological computing and affective computing. Our work focuses on using brain input for this purpose, measured through functional near-infrared spectroscopy (fNIRS), as a way of increasing the narrow communication bandwidth between human and computer. Most previous brain-computer interfaces have been designed for people with severe motor disabilities and use explicit signals as the primary input; but these are too slow and inaccurate for wider use. Instead, we use brain measurement to obtain more information about the user and their context directly and without asking additional effort from them. We have obtained good results in a number of systems we created, as measured by objective task performance metrics. I will discuss our work on brain-computer interfaces and the more general area of implicit interaction.

Bio: Robert Jacob is a Professor of Computer Science at Tufts University, where his research interests are new interaction modes and techniques and user interface software; his current work focuses on implicit brain-computer interfaces. He has been a visiting professor at the University College London Interaction Centre, Universite Paris-Sud, and the MIT Media Laboratory. Before coming to Tufts, he was in the Human-Computer Interaction Lab at the Naval Research Laboratory. He received his Ph.D. from Johns Hopkins University, and he is a member of the editorial board for the journal Human-Computer Interaction and a founding member for ACM Transactions on Computer-Human Interaction. He has served as Vice-President of ACM SIGCHI, Papers Co-Chair of the CHI and UIST conferences, and General Co-Chair of UIST and TEI. He was elected as a member of the ACM CHI Academy in 2007 and as an ACM Fellow in 2016.