

Allison Okamura

Professor

Department of Mechanical Engineering

Stanford University

Wearable Tactile Devices for XRI

Haptic devices allow touch-based information transfer between humans and intelligent systems, enabling communication in a salient but private manner that frees other sensory channels. For such devices to become ubiquitous, their physical and computational aspects must be intuitive and unobtrusive. The amount of information that can be transmitted through touch is limited in large part by the location, distribution, and sensitivity of human mechanoreceptors. Not surprisingly, many haptic devices are designed to be held or worn at the highly sensitive fingertips, yet stimulation using a device attached to the fingertips precludes natural use of the hands. Thus, in this tutorial we will examine the design of a wide array of haptic feedback mechanisms, ranging from devices that can be actively touched by the fingertips to multi-modal haptic actuation mounted on the arm. We demonstrate how these devices are effective in virtual reality, human-machine communication, and human-human communication.

Biosketch

Allison M. Okamura received the BS degree from the University of California at Berkeley and the MS and PhD degrees from Stanford University, all in mechanical engineering. She is currently Professor in the mechanical engineering department at Stanford University, with a courtesy appointment in computer science. She is an IEEE Fellow and Editor-in-Chief of the journal IEEE Robotics and Automation Letters. Her awards include the 2016 Duca Family University Fellow in Undergraduate Education, 2009 IEEE Technical Committee on Haptics Early Career Award, 2005 IEEE Robotics and Automation Society Early Academic Career Award, and 2004 NSF CAREER Award. Her academic interests include haptics, teleoperation, virtual environments and simulators, medical robotics, neuromechanics and rehabilitation, prosthetics, and engineering education. Outside academia, she enjoys spending time with her husband and two children, running, and playing ice hockey. For more information about her research, please see the Collaborative Haptics and Robotics in Medicine (CHARM) Laboratory website: <http://charm.stanford.edu>.

