Human-Centered Principles and Methods for Designing Robotic Technologies

The increasing emergence of robotic technologies that serve as automated tools, assistants, and collaborators promises tremendous benefits in everyday settings from the home to manufacturing facilities. While these technologies promise interactions that can be highly complex and beneficial, their successful integration into the human environment ultimately requires these interactions to also be natural and intuitive. To achieve complex but intuitive interactions, designers and developers must simultaneously understand and address human and computational challenges. In this talk, I will present my group’s work on building human-centered guidelines, methods, and tools to address these challenges in order to facilitate the design of robotic technologies that are more effective, intuitive, acceptable, and even enjoyable through successful integration into the human environment. The first part of the talk will review a series of projects that will demonstrate how the marrying of knowledge about people and computational methods through a systematic design process can enable effective user interactions with social, assistive, and telepresence robots. The second part of the talk will cover ongoing work that provides designers and developers with tools to apply these guidelines to the development of real-world robotic technologies and that utilizes partnerships with domain experts and end users to ensure the successful integration of these technologies into everyday settings. The talk will conclude with a discussion of high-level design guidelines that can be drawn from this body of work and a roadmap for future research.

Bio:
Bilge Mutlu is an associate professor of computer science, psychology, and industrial engineering at the University of Wisconsin–Madison. He received his Ph.D. degree from Carnegie Mellon University’s Human-Computer Interaction Institute in 2009. His background combines training in interaction design, human-computer interaction, and robotics with industry experience in product design and development. Dr. Mutlu is a former Fulbright Scholar and the recipient of the NSF CAREER award as well as several best paper awards and nominations, including HRI 2008, HRI 2009, HRI 2011, UbiComp 2013, IVA 2013, RSS 2013, HRI 2014, CHI 2015, and ASHA 2015. His research has been covered by national and international press including the NewScientist, MIT Technology Review, Discovery News, Science Nation, and Voice of America. He has served in the Steering Committee of the HRI Conference and the Editorial Board of IEEE Transactions on Affective Computing, co-chairing the Program Committees for ROMAN 2016, HRI 2015, ROMAN 2015, and ICSR 2011, the Program Sub-committees on Design for CHI 2013 and CHI 2014, and the organizing committee for HRI 2017. More information on Dr. Mutlu and his research can be found at http://bilgemutlu.com and http://hci.cs.wisc.edu.