Human-Machine and Human-Robot Interaction for Long-Term User Engagement and Behavior Change

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ABSTRACT

The nexus of in-home intelligent assistants, activity tracking, and machine learning creates opportunities for personalized virtual and physical agents / robots that can positively impacts user health and quality of life. Well beyond providing information, such agents can serve as physical and mental health and education coaches and companions that support positive behavior change. However, sustaining user engagement and motivation over long-term interactions presents complex challenges. Our work over the past 15 years has addressed those challenges by developing human-machine (human-robot) interaction methods for socially assistive robotics that utilize multi-modal interaction data and expressive agent behavior to monitor, coach, and motivate users to engage in heath- and wellness-promoting activities. This talk will present methods and results of modeling, learning, and personalizing user motivation, engagement, and coaching of healthy children and adults, as well as stroke patients, Alzheimer's patients, and children with autism spectrum disorders, in short and long-term (month+) deployments in schools, therapy centers, and homes, and discuss research and commercial implications for technologies aimed at human daily use.

CCS Concepts/ACM Classifiers

Human-centered computing, assistive technologies, HCI, robotics

Author Keywords

Human-machine interaction, human-robot interaction, socially assistive agents

BIOGRAPHY

Maja Matarić is Chan Soon-Shiong Distinguished Professor of Computer Science, Neuroscience, and Pediatrics at the University of Southern California, founding director of the USC Robotics and Autonomous Systems Center, and Vice Dean for Research in the Viterbi School of Engineering. Her MS and PhD are in Computer Science and Artificial Intelligence, and her BS in in Computer Science from the University of Kansas. She is Fellow of AAAS, IEEE, and AAAI, and the recipient of the US Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring, Anita Borg Institute Women of Vision Award in Innovation, the Okawa Foundation Award, NSF Career Award, MIT TR35 Award, and IEEE RAS Early Career Award. A pioneer of distributed robotics and, more recently, socially assistive robotics, Prof. Matarić's research enables robots to help people improve through empowering interaction in rehabilitation, training, and education. Her Interaction

Lab is developing robot-assisted therapies for autism, stroke, Alzheimer's and other domains. She has published extensively, authored "The Robotic Primer" (MIT Press), has served as associate editor on three journals, on the NSF CISE Advisory Committee, and other advisory boards. Prof. Matarić is also actively involved in leading K-12 STEM outreach efforts that engage student interest in science, technology, engineering, and math (STEM) topics and careers.

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