Social Robots - Robotics and Toy Computing Minitrack

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Abstract

This HICSS-57 mini-track aims to present novel and industrial solutions to challenging technical issues of Human-Robot Interaction (HRI) and compelling social robot use cases. In addition, this mini-track will share related practical experiences to benefit the reader and provide clear proof that social robots play an ever-increasing essential and critical role in supporting robotic and toy computing applications - a new cross-discipline research topic in computer science, decision science, management sciences, and information systems.

1. Introduction

A social (companion) robot, such as anthropomorphic and zoomorphic designs, consists of a physical humanoid robot component that connects through a network infrastructure to online services that enhance traditional robot functionality. For example, zoomorphic robots potentially act as social companions like pets that can be used in Robot-assisted Therapy (RAA) to improve autism spectrum disorders and emotional well-being, Humanoid robots usually behave like natural social interaction partners for human users, with features such as speech, gestures, and eye-gaze, referring to the users' data and social background. The usage behavior of users of anthropomorphic robots indicates that users are more open to robots. For example, prior research shows that it is much easier for an embodied humanoid robot to trust users to release their personal information than a disembodied interactive kiosk. Human-Robot Interaction (HRI) is a research area of understanding, designing, and evaluating robots for use by or with humans from the social-technical perspectives.

Artificial Intelligence (AI) technologies have recently been applied to robotic and toy computing. Robotic computing is one branch of AI technologies, and their synergistic interactions enable and are enabled by robots. Social robots can now easily capture a user's physical activity state (e.g., walking, standing, running, etc.) and store personalized information (e.g., face, voice, location, activity patterns, etc.) through the camera, microphone, and sensors AI technologies. Toy computing is a recently developing concept that transcends the traditional toy into a new computer research area using AI technologies. A toy in this context can be effectively considered a computing device or peripheral called Smart Toys. We invite research and industry papers related to these specific challenges and others driving innovation in robotics and toy computing for social robots.

There are four research papers presented in this mini-track. The first paper is "Understanding the Value Co-creation Potential of Social Robots in Primary School Education" by Korhonen et al. The second paper is "Adaptive Defence of the Internet of Things (IoT) using the Belief-Desire-Intention (BDI) Model for Social Robots" by Rafferty and MacDermott. The third paper is "A Preliminary Design of Privacy Ontology for Smart Toys" by Albuquerque et al. The fourth paper is "Designing Anthropomorphic Robots For The Real World: Morphological Analysis For Design Science Research On Current And Upcoming Robot Technologies" by Leichtle and Homburg.

URI: https://hdl.handle.net/10125/106593
978-0-9981331-7-1