

Invited Speaker 6

Invited Speech Title: **Predicting Trust of Humanoid Robots in Service Scenarios; Implications for Human-Robot-Human Interaction**



Dr. Halimahtun M. Khalid is President of Damai Sciences, Malaysia. She obtained her PhD in cognitive ergonomics from University College London, UK. She has 35 years of knowledge and experience in HCI, human factors and ergonomics. She was Professor of Cognitive Ergonomics at Universiti Malaysia Sarawak, Malaysia, where she established the Institute of Design & Ergonomics Application, the Centre for Applied Learning & Multimedia, and the first Virtual Reality Centre. She has delivered several keynotes at international conferences, and has more than 100 publications in refereed journals and proceedings. She received research grants from the

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European Commission and US Air Force for projects related to mass customization, cultural cognition, disaster attitudes, and human-robotic trust. Dr. Khalid is the Founder and Past President of the Human Factors and Ergonomics Society Malaysia, and Past President of the Southeast Asian Network of Ergonomics Societies. She is Past Chair of the Science Technology & Practice Committee of the International Ergonomics Association (IEA), and Past Chair of the Affective Design Technical Committee of the IEA. She is a Certified Human Factors Professional with BCPE USA, and a Fellow of the International Ergonomics Association.

Abstract:

Trust is a key element in the development of effective human-robot-human relationships. In particular, trust affects system effectiveness as it relates to safety, performance, and usability. With the development and integration of humanoid robots in human teams, the issue of predicting trust has become a focal concern. Setting the scene, we will trace a decade of research into human-robotic trust starting from 2006. One of the research gaps is the lack of a reliable measure of human-robotic trust. Past studies have emphasized on subjective measurements only. In this plenary, we will present a method where subjective (general trust, psychological) and objective (physiological) measures were mapped to predict human trust of humanoid robots in performing social tasks in a multi-actor, multi-dialog, and bilingual contexts. We will present the findings from two studies, involving different humanoid robots and diverse types of interactive dialogs in business, disaster and healthcare application domains. Extraction of objective measures includes facial expressions, voiced speech, camera-based heart rate, and gestural posture. Subjective trust comprised fifteen items that measured ability, benevolence and integrity. A neuro-fuzzy algorithm extracted rules that predicted low, medium and high trust levels. The implications of the findings on future human-robotic trust relationships and limitations of the method will be discussed.