IEEE SMC 2022
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IEEE SMC 2022
International Conference on Systems, Man, and Cybernetics

Clarion Congress Hotel Prague, Czech Republic
October 9-12, 2022

Special Session

Code: 5qxif

Title

Immersive Telepresence Technologies, Experiences and Applications – Telepresence 2.0

Proposer / Main Organizer

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Tiago H. Falk is a Full Professor at INRS-EMT where he directs the Multisensory Signal Analysis and Enhancement Laboratory. His research interests lie in measurement of quality-of-experience models for multisensory immersive experiences with applications spanning healthcare, entertainment, and education. He is co-chair of the SMCS BMI TC and a member-at-large of the SMCS BoG.

Adrian Stoica has 35 years of R&D experience, of which the last 25 year at NASA Jet Propulsion Laboratory. For over 10 years he has managed the Robotics Systems Estimation, Decision, and Control Group at JPL and is currently serving as Program Manager for Strategic Programs at JPL.
Adrian served two terms as VP for SMCS. He is the Chair of the Human and Robotic Space Exploration Systems Technical Committee in SSE Technical Area.

Nikhil Deshpande is a Researcher in Advanced Robotics at Istituto Italiano di Tecnologia (IIT), Italy, where he leads the Vicarios Mixed Reality and Simulations Lab, focused on enhancing presence and situational awareness for operators in remote robotic teleoperation scenarios. Previously, he was a postdoc at IIT itself in telesurgery, and completed his PhD in autonomous robot navigation at the North Carolina State University, USA in 2012.

Jan van Erp is principal scientist with The Netherlands Organization for Applied Scientific Research (TNO) and full professor of tangible user interaction with the University of Twente. His research focuses on multisensory perception and cognition, applied neuroscience, robotics, and human-machine collaboration in complex environments. Jan holds several auxiliary positions and serves as the current (vice-)president of the Eurohaptics Society.

Salvatore Livatino is Reader in Virtual Reality and Robotics at the University of Hertfordshire, United Kingdom, where he leads the VR and Robotics lab. Previously, he was Associate Professor at Aalborg University, Denmark, where he completed his PhD in 2003. His research interests are in 3D visualization, virtual, augmented and mixed reality, with focus on user interfaces for tele-exploration, teleoperation and control panels.

IEEE Member or SMC Society Member

Tiago Falk, IEEE SMCS Member
Adrian Stoica, IEEE SMCS Member
Nikhil Deshpande, IEEE Member
Salvatore Livatino, IEEE Member

Category

Please select one of the following categories:
Systems Science and Engineering

Number of Expected Paper Submissions:

6 +

Keywords

Telepresence, virtual and augmented reality systems, robotic systems, Intelligent Assistants and Advisory Systems, Modeling of Autonomous systems, Human machine cooperation and systems, multisensory experiences

Brief Description and Justification (200-250 words):

The term "telepresence" has traditionally been used to describe experiences in which the user is present at a live real-world location remote from their own physical location. This has commonly been achieved by means of robotic teleoperation coupled with audio-visual capabilities. While this itself carries a number of challenges, some may argue that this is not very immersive or realistic, as only two of our five senses are typically stimulated. And even then, limited field-of-view and stereo audio are often used. As communications, audio, speech, haptics, olfactory, and digital taste technologies are emerging, the timing is ripe for the field to evolve into what we call "Telepresence 2.0". In this special session, we will cover aspects related to i) Telepresence 2.0 enabling technologies, from communication protocols, to control systems, new sensor systems (e.g., olfactory, haptic), and holographic/360º video and immersive audio systems, ii) models of the user experience for such systems, and iii) next-generation applications in space exploration, healthcare, education, remote operation of machines, and entertainment.

This special session is endorsed by the IEEE SMCS Brain-Machine Interface Systems TC, the Robotic and Human Space Exploration Systems TC, and the Telepresence Initiative steering committee.