The 2020 VGTC Virtual Reality Best Dissertation Award

Misha Sra

The 2020 VGTC Virtual Reality Best Dissertation Award goes to Misha Sra, a 2018 graduate from the Massachusetts Institute of Technology, for her dissertation entitled, “A Framework for Enhancing the Sense of Presence in Virtual and Mixed Reality”.

Misha Sra is the John and Eileen Gerngross Assistant Professor in the Computer Science department at the University of California Santa Barbara, where she directs the Perceptual Engineering Lab. She is a member of UCSB’s Center for Responsible Machine Learning (CRML) and Center for Interactive and Visual Computing (CIVC). She completed her Ph.D. in the Fluid Interfaces Group at the MIT Media Lab under the direction of Prof. Pattie Maes. Her dissertation focuses on translating the ease and expressiveness with which our bodies interact with the physical world into the design of virtual experiences for increased immersion and presence.

Dr. Sra’s dissertation proposes a four-dimensional framework derived from psychologist J. J. Gibson’s theory of perception, where the reality of experience is grounded in action. When applied to VR, Gibson’s theory suggests that the fidelity of the virtual experience is determined by the interplay between visual, aural, or haptic feedback and the actions of looking, moving or manipulating objects. To enhance experiential fidelity, Misha’s work integrates extrinsic elements of the user’s real-world context, like their physical space or their physiological state, with intrinsic elements like the application design or integrated interaction techniques. This approach focuses on the non-visual modalities of proprioception, kinesthesia and physiological sensing for creating both explicit and implicit interactions between the real and the virtual environments. For example, she demonstrates electrical stimulation of the user’s vestibular system as a method of subtly manipulating the user’s real-world walking trajectory, and breathing as a directly controlled physiological input method of implicitly integrating the user’s body in the virtual experience.

Award Information

The IEEE VGTC Virtual Reality Best Dissertation Award was established in 2016. This award is given every year to the author of the best doctoral dissertation in the broad field of virtual reality, defended within the preceding two calendar years. Eligible nominees for the 2020 award included the authors of all relevant dissertations defended between January 1, 2018 and December 31, 2019. A total of thirteen nominations were received and were carefully reviewed by the IEEE VR Best Dissertation awards committee, which consisted of thirteen leading experts in the field. Each dissertation was read in full by three panel members, and after an initial binning process, the top-ranked dissertations were subsequently read (or re-read) by all panelists to determine the winner.

The 2020 VGTC Virtual Reality Best Dissertation Honorable Mention

Folker Wientapper

Technical University of Darmstadt / Visometry GmbH

Dissertation Title: Optimal Spatial Registration of SLAM for Augmented Reality

Advisor: Arjan Kuijper

Dr. Wientapper’s work is centered on the fundamental requisite in augmented reality to have the displayed virtual objects spatially well-aligned with the perceived real environment. New approaches are explored as to how users can register SLAM-based tracking methods to a desired target coordinate system, and new numerical algorithms are presented that make optimal use of the information provided. Part of the work is also a patented method for calibrating AR-based head-up displays.