ISTeC
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COLORADO STATE UNIVERSITY

Distinguished Lectures

Fall 2023

Dr. Gregory Welch

Pegasus Professor
The AdventHealth Endowed Chair in Healthcare Simulation
College of Nursing
University of Central Florida

ISTeC Distinguished Lecture

The Virtual Experience Research Accelerator (VERA)

Monday Nov. 13, 2023
Reception with refreshments: 10:30 a.m.
Lecture: 11:00 a.m-12:00 noon
LSC Ballroom A

Special Seminar

Universal User Data (UUD) for Virtual Experience Research

Monday, Nov 13, 2023
Lecture: 2:00-3:00 p.m.
CSB 130

Sponsored by
Information Science and Technology Center (ISTeC)
In conjunction with the Department of Computer Science and Department of Electrical and Computer Engineering Seminar Series

Abstracts

The Virtual Experience Research Accelerator (VERA)

Virtual Reality researchers carrying out human subjects research typically find themselves working very hard, over considerable time, to run human subjects experiments that end up producing very narrow findings, with minimal statistical power, for a limited population. More than two years ago we realized the problem is with the fundamental approach we use to carry out human subject research. Over the ensuing 14 months, with input from hundreds of Virtual Reality (VR) researchers around the world, we developed comprehensive plans for a four-year effort to develop a transformative new research infrastructure in the form of a human-machine system (hardware, software, and people) that combines and extends aspects of distributed lab-based studies, online studies, research panels, and crowdsourcing, into a unified system for carrying out VR-based human subject research. The system will enable researchers to conduct user studies online, concurrently across a large, carefully curated, diverse, and dedicated standing pool of study participants. We call our proposed infrastructure the Virtual Experience Research Accelerator (VERA). I will share a bit of the story of VERA, the status, some plans, some newly discovered challenges, and some opportunities for community involvement.

Universal User Data (UUD) for Virtual Experience Research

Some key motivations for the development of the NSF-supported Virtual Experience Research Accelerator (VERA) are to mitigate the issues associated with laboratory-based human subjects research, including larger sample sizes, more diverse and inclusive samples, and faster turn-around. Despite more than a year of careful planning, and scrutiny of every aspect of VERA we were aware of, we did not foresee three major issues: in the distributed online paradigm of VERA each study participant will be using a different VR system, in a different place, and the differences in individual participant abilities could result in user data that is statistically different such that it might be excluded, when it otherwise should not be. These confounding three differences have motivated the development of algorithms, policies, and procedures for data signal processing and re-targeting to achieve Universal User Data (UUD) that can be appropriately compared within studies, across studies, over time, for as many purposes as we can imagine. I will share a bit of the story of UUD, including new found motivations, and some of our planned approaches.

Speaker Biography

Gregory Welch is a Pegasus Professor and the AdventHealth Endowed Chair in Healthcare Simulation at the University of Central Florida College of Nursing. A computer scientist and engineer, he also has appointments in the College of Engineering and Computer Science and in the Institute for Simulation & Training. Welch earned his B.S. in Electrical Engineering Technology from Purdue University (Highest Distinction), and his M.S. and Ph.D. in Computer Science from the University of North Carolina at Chapel Hill (UNC). Previously, he was a research professor at UNC. He also worked at NASA's Jet Propulsion Laboratory and at Northrop-Grumman's Defense Systems Division. His research interests include human-computer interaction, human motion tracking, virtual and augmented reality, computer graphics and vision, and training related applications. He is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and a Fellow of the National Academy of Inventors (NAI). His awards include induction into the IEEE Virtual Reality Academy in 2022, the IEEE Virtual Reality Technical Achievement Award in 2018 (VR 2018), and the Long Lasting Impact Paper Award at the 15th IEEE International Symposium on Mixed and Augmented Reality (ISMAR 2016).

To arrange a meeting with the speaker, please contact Prof. Mohammed Arefin {Mohammed.Arefin@colostate.edu}.

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