VENVI: USING DANCE AND VIRTUAL REALITY TO GET MIDDLE SCHOOL CHILDREN INTERESTED IN COMPUTER SCIENCE

Abstract:
In this talk we will present the design, implementation, and initial evaluation of a virtual reality education and entertainment application called Virtual Environment Interactions (VENVI). Using VENVI, students learn computer science concepts through the process of choreographing movement for a virtual character using a fun and intuitive interface. Participants programmatically craft a dance performance for a virtual human and participate in an immersive embodied interaction metaphor in VENVI. We qualitatively and quantitatively evaluated the extent to which the activities within VENVI facilitated students’ edutainment, presence, interest, excitement, and engagement in computing, and the potential to alter their perceptions of computing and computer scientists.

Bio:
Dhaval Parmar is a PhD Candidate in the Computer Science division of the School of Computing at Clemson University, focusing on Virtual Reality (VR). His work contributes to human factors research involving the field of VR. Currently exploring the domain of Computer Science Education, he is studying how VR can help in fostering interest in learning computational concepts among under-represented minority groups. He is also working on understanding how middle school students react to experiences within VR, and how VR can be integrated into school curriculum. He obtained his Bachelor of Engineering degree in Computer Engineering from the University of Mumbai, India.

AN EMPIRICAL EVALUATION OF VISUO-HAPTIC FEEDBACK ON PHYSICAL REACHING BEHAVIORS DURING 3D INTERACTION IN REAL AND IMMERSIVE VIRTUAL ENVIRONMENTS

Abstract:
In an initial study, we characterized the properties of human reach motion in the presence or absence of visuo-haptic feedback in real and immersive virtual environments (IVEs) or virtual reality within a participant’s maximum arm reach. Our goal is to understand how physical reaching actions to the perceived location of targets in the presence or absence of the visuo-haptic feedback are different between real and virtual viewing conditions. Typically, participants reach to the perceived location of objects in the 3D environment to perform selection and manipulation actions during 3D interaction in applications such as virtual assembly or rehabilitation. In these tasks, participants typically have distorted perceptual information in the IVE as compared to the real world, due to technological limitations such as minimal visual field of view, resolution, latency and jitter. In an empirical evaluation, we asked the following questions; i) how do the perceptual differences between virtual and real world affect our ability to accurately reach to the locations of 3D objects, and ii) how do the motor responses of participants differ between the presence or absence of visual and haptic feedback? We examined factors such as velocity, acceleration and distance of physical reaches between the real world and IVE, both in the presence or absence of visuo-haptic information. The results suggest that physical reach responses vary systematically between real and virtual environments especially in situations involving presence or absence of visuo-haptic feedback. The implications of our study provide a methodological framework for the analysis of reaching motions for selection and manipulation with novel 3D interaction metaphors and to successfully characterize visuo-haptic versus non visuo-haptic physical reaches in virtual and real world scenarios.

Bio:
Ellie Ebrahimi is a fourth year PhD student in the Human-Cantered Computing. She is investigating the effects of visual and/or haptic calibration on depth perception in Virtual Reality (VR). She recently started investigating the recalibration of space after tool usage and its effect on action modes in VR. She attained her M.Sc. in Mechatronics Engineering from K.N. Toosi University of Technology, Tehran, Iran and her B.Sc. in Robotic Engineering from Shahrood University of Technology, Shahrood, Iran.

Friday, September 23, 2016 @ 2:30 pm  McAdams Hall, Room 119

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