Modeling and Simulation of Multi-Agent Systems and Multi-User Virtual Reality Environments for Emergency Evacuation

Friday, 3/03/17 | 11am-12pm | West Hall, W105
Speaker: Dr. Sharad Sharma
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Abstract: Crowd simulations are powerful tools for visualizing, analyzing, and communicating how a venue will work or testing evacuations scenarios in emergencies. Human behavior is difficult to model and simulate due to the high level of uncertainty involved because human behavior is unpredictable. Computer simulation is an invaluable tool for modeling emergency evacuations because it is cost effective, saves time, and ensures that no lives are put at risk. Computer simulation makes it relatively easy to test a multitude of scenarios with a variety of environmental conditions. Crowd simulation can be used to observe the influence different behaviors such as calm, panic, and cooperation have on evacuation models. According to federal aviation administration regulation, the people have to evacuate the aircraft in 90 seconds. This talk will describe the modeling capabilities within AvatarSim evacuation model to simulate human behavior characteristics and judgment decisions for an airplane evacuation. AvatarSim model is a goal oriented multi-agent system based on intelligent AI agent based technology. Its applications range from evacuation behavior scenarios to battle field scenarios to aircraft scenarios.

Biography: Dr. Sharad Sharma is the Director of Virtual Reality Laboratory and Associate Professor of Computer Science at Bowie State University. Dr. Sharma’s research specialization includes modeling and simulation of emergency response and decision making, evacuation scenarios, software engineering, multi-agent systems, gaming, virtual reality, fuzzy logic, and neural network. He has won the "Outstanding Researcher Award" in year 2013 and 2011, "Outstanding Faculty Award" in year 2012 in College of Arts and Science at Bowie State University. Recently in 2016, he has worked on a faculty research fellowship in the Human Research and Engineering Directorate (HRED) division in Army Research Laboratory (ARL) at Aberdeen Proving Ground (APG), Aberdeen, Maryland. He is involved in developing new data and visualization methods for course of action planning, visualization, training, and assessment. He is also exploring socio-cultural issues in Collaborative Virtual Environments (CVE) for emergency response and decision making in dense urban environments. He is also the Program Chair, for the Twenty Sixth ISCA International Conference on Software Engineering and Data Engineering (SEDE 2017).