Announcing the Final Examination of Luis Vazquez for the degree of Doctor of Philosophy

Time & Location: June 21, 2018 at 9:00 AM in Partnership II 301

Title: TRACKING THE FEASIBILITY AND RELIABILITY OF MOBILE SENSORS TO TRACK HUMAN PHYSIOLOGICAL SIGNALS FOR PERSONALIZED LEARNING TO ENHANCE TABLET-BASED INTELLIGENT TUTORING SYSTEMS

Desktop-based intelligent tutoring systems have existed for many decades, but the advancement of mobile computing technologies has sparked interest in developing mobile intelligent tutoring systems (mITS). Personalized mITS are applicable to not only stand-alone and client-server systems but also cloud systems possibly leveraging big data. Device-based sensors enable even greater personalization through capture of physiological signals during periods of student study. However, personalizing mITS to individual students faces challenges. The Achilles heel of personalization is the feasibility and reliability of these sensors to accurately capture physiological signals.

This research benchmarks feasibility and reliability of basic mobile platform sensors in various student postures. The research software and methodology are generalizable to a range of platforms and sensors. Incorporating the tile-based puzzle game 2048 as a substitute for a knowledge domain also enables a broad spectrum of test populations. Baseline sensors include the on-board camera to detect eyes/faces and the Bluetooth Empatica E4 wristband to capture heart rate, electrodermal activity (EDA), and skin temperature. The test population involved 100 collegiate students randomly assigned to one of three different ergonomic positions in a classroom: sitting at a table, standing at a counter, or reclining on a sofa. Well received by the students, EDA proved to be more reliable than heart rate or face detection in the three different ergonomic positions. Additional insights are provided on advancing learning personalization through future sensor feasibility and reliability studies.

Major: Modeling and Simulation

Educational Career:
Bachelor's of Computer Science, BS, 2000, University of Central Florida
Master's of Computer Science, MS, 2005, University of Central Florida
Master's of Modeling and Simulation, MS, 2011, University of Central Florida

Committee in Charge:
Michael Proctor, Chair, Industrial Engineering & Management Systems
Avelino Gonzalez, College of Engineering & Computer Science
Florian Jentsch, College of Sciences
Robert Sottilare, Modeling & Simulation

Approved for distribution by Michael Proctor, Committee Chair, on May 13, 2018.

The public is welcome to attend.