Announcing the Final Examination of Larry Lowe for the degree of Doctor of Philosophy

Time & Location: July 6, 2020 at 11:00 AM in Zoom Meeting https://ucf.zoom.us/j/97401222165
Title: INTEGRATION OF ARTIFICIAL INTELLIGENCE AND VIRTUAL AND CONSTRUCTIVE SIMULATIONS TO INCREASE PERFORMANCE: TWO CASE STUDIES WITH BIG DATA AND AGENT-BASED SIMULATION

Virtual and Constructive (VC) simulations can be used to contribute to measure weapon effectiveness and support the capture of the operator's behavior. These areas are very non-linear, and Artificial Intelligence can support better analysis due to its way of dealing with incomplete information, noise, and nonlinearities.

VC simulations focus on scenario variation and sensitivity analysis to find critical factors of success. This variation is a significant necessity for reducing bias. These scenario variations and the relative easiness to program numerous scenarios makes VC an excellent candidate to generate data from different sources. The combined data can be processed by an analytics tool, using AI/machine learning, to build useful models that can be used to study weapon effectiveness (and extrapolating beyond linear models) and build behavioral models that can encapsulate behavior. This encapsulated behavior can be used in other scenarios and study ways to enhance training or counterattacks.

The dissertation ends with conclusions, limitations of the research project, contributions to the body of knowledge, and further research. The issues of new research go in details of a potential methodology to guide instructors on delivering effectiveness-focused training by utilizing Virtual and Constructive (VC) simulations, big data (consisting of performance metrics and usability assessments), and AI/machine learning.

Major: Industrial Engineering

Educational Career:
Bachelor's of Electrical Engineering, BS, 2008, University of Central Florida
Master's of Industrial Engineering, MS, 2011, University of Central Florida

Committee in Charge:
Luis Rabelo, Chair, Industrial Engineering and Management Systems
Ahmad Elshenawy, Industrial Engineering and Management Systems
Katelyn Procci, External
Gene Lee, Industrial Engineering and Management Systems

Approved for distribution by Luis Rabelo, Committee Chair, on June 22, 2020.

The public is welcome to attend.