Announcing the Final Examination of Thomas Clark for the degree of Doctor of Philosophy

Time & Location: March 28, 2019 at 1:30 PM in Engr II 310

Title: A FRAMEWORK TO DEVELOP ANOMALY DETECTION/FAULT ISOLATION ARCHITECTURE USING SYSTEM ENGINEERING PRINCIPLES

For critical systems, timely recognition of an anomalous condition immediately starts the evaluation process. For complex systems, isolating the fault to a component or subsystem results in corrective action sooner so that undesired consequences may be minimized. There are many unique anomaly detection and fault isolation capabilities available with innovative techniques to quickly discover an issue and identify the underlying problems.

This research develops a framework to aid in the selection of appropriate anomaly detection and fault isolation technology to augment a given system. To optimize this process, the framework employs a model based systems engineering approach. Specifically, a SysML model is generated that enables a system-level evaluation of alternative detection and isolation techniques, and subsequently identifies the preferable application(s) from these technologies.

A case study is conducted on a cryogenic liquid hydrogen system that was used to fuel the Space Shuttles at the Kennedy Space Center, Florida (and will be used to fuel the next generation Space Launch System rocket). This system is operated remotely and supports time-critical and highly hazardous operations making it a good candidate to augment with this technology. As the process depicted by the framework down-selects to potential applications for consideration, these too are tested in their ability to achieve required goals.

Major: Industrial Engineering

Educational Career:
Bachelor's of Business Admin, BS, 1988, Rollins College
Bachelor's of Computer Science, BS, 1996, Rollins College
Master's of Industrial Engineering, MS, 2012, UCF

Committee in Charge:
Luis Rabelo, Chair, IEMS
Gene Lee, Co-Chair, IEMS
Ahmad Elshennawy, UCF
Hulya Yazici, Florida Gulf Coast University

Approved for distribution by Luis Rabelo, Committee Chair, on March 13, 2019.

The public is welcome to attend.