



**CAIDA CUI Confirmation for OMRS & LCC
SOCRRATES Emulator
and
iSEE Upgrade, Operations, & Analysis**

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Division: Exploration
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Abstract

This internship has focused on providing solutions for the Customer Avionics Interface Development and Analysis (CAIDA) subsystem. The main emulator that has been used during this internship is the Software-Only CEV Risk Reduction Analysis and Test Engineering Simulator (SOCRRATES). This emulator uses advanced math and physics methods to simulate specific points in a mission, such as ascent, entry, and orbit. Exploration Ground Systems (EGS) must ensure that all KSC based ground systems can be properly integrated with the flight vehicle software, therefore, the Modeling and Simulation Branch (NE-XM) of the KSC Engineering Directorate supports a virtual environment that simulates the interface between ground systems and the flight vehicle. A primary component in assuring that is knowing whether the emulators have incorporated the correct CUIs into their system, as well as understanding both the static and dynamic responses of the individual CUIs. Also, an effort for verification of Operational Maintenance Requirements Specifications (OMRS) and Launch Commit Criteria (LCC) that are supported by SOCRRATES for the Orion Crew Module were part of the project tasks this semester.

In addition, Exploration Systems and Operations Division was previously tasked with bringing the iSEE (Formerly HEMAP (Human Engineering Modeling and Performance) Human Factor Tool) back online and to a functioning status. The lab was designed originally to evaluate the viability of utilizing 3D modeling motion capture as a platform to perform human factor analysis for tasks in the shuttle program. More recently the lab underwent revitalization to support some of the modern day operations of the center as well as Space Launch System (SLS) research and development efforts. This internship also focused on comparing two different simulation Commercial off the shelf (COTS) products and to determine whether or not a COTS package was a viable replacement for the current software that the iSEE lab uses. Upon research

and testing, I found that this software was not feasible for the lab. It could not easily load CAD or CREO models, give live feedback while the user is in the environment, and was not compatible with a virtual reality headset, all of which are necessary for the lab.

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