



Orion Heat Shield Spectrometer - Make That App!

Project Title	Orion Heat Shield Spectrometer - Make That App!
Project Summary	Develop and test ground software application to process, display and interpret the data stored in the Orion Spacecraft heat shield spectrometer.
Country	United States
Agency	National Aeronautics and Space Administration
DoS Office	N/A
Post	N/A
Section	N/A
Number of Interns	4

Project Description

The purpose of this project is to develop a software application that will allow the spectrum data to be visualized, processed and represented in various forms. A 32MByte file will be provided containing the captured data which represents 8191 spectrums captured at 14 spectrums per second. The application will take that data and create visual representations of the heat shield spectrums which can be viewed and manipulated by the user. Must be knowledgeable in developing computer programs which can be run in/under Windows.

Desired Skills Interests

- Skill
- computer science
 - software engineering
 - electrical engineering

Additional Information

A heat shield spectrometer has been developed which will gather spectrum data from the Orion Spacecraft heat shield during re-entry. This capability is needed to better understand the states that the heat shield experiences as it ablates slowing the spacecraft to speeds that can then employ parachutes. The first flight, EFT-1, did not include a spectrometer. The Orion Heat Shield Spectrometer (OHSS) is currently planned to be included on upcoming exploration missions.

The software application will include: a) ability to create a movie including all captured spectrums and the ability to scan backwards and forwards through the movie, b) time tagging, c) indexing, d) ability to produce numerical representations as well as graphical, e) statistical information, f) exporting individual spectrums to image files and data files, g) noise analysis, h) identification of outliers, i) ability to subtract thermal noise / dark current, j) data smoothing and filtering, k) ability to isolate store and / or display sections of the spectrum and l) reports containing summary of data set statistics. It is preferred that the software application be developed in Matlab but other programming environments that provide data visualization can be considered. The application must run under Windows and not require special software to be installed on the user's computer.

Language Requirements

None