

Morrison Ray Lucas

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Clearance: Secret, SSBI

Raytheon- Engineer / Section manager

Fall 2003-Present

Controller design, simulation, analysis, and troubleshooting

- Led the effort to identify and correct an intermittent instability in the STSS track gimbal controller due to the interaction of an incorrect anti-windup implementation with inertial sensor noise near the gimbal singularity.
- Successfully managed a small contract to re-tune the STSS controller to increase robustness to uncertainty in the underlying physical system.
- Derived susceptibility of the VIIRS line-of-sight to spacecraft disturbances. Included updates to the Simulink model, integration with an updated structural model generation of methods to assess requirements based on the model, and generation of a model description document for use throughout the life of the VIIRS program.

Calibration and estimation design

- Designed, implemented and tested the distortion calibration tool for the STSS acquisition sensor to correct repeatable line-of-sight errors in the STSS acquisition sensor based on observations of a laser ground source from a known location. Challenges included: basis function selection and quality assessment; quality assessment of curve fit; handling of outlier/noise data points; atmospheric distortion and uncertainty; time/budget constraints.

System engineering and system analysis

- Owned requirements family on a space program. Responsible for system error modeling; auditing of input analyses and data; identifying and filling missing pieces (white space); selling requirements to customer.

Test design and test data analysis

- Designed, executed, and analyzed tests of the geometric algorithms on the STSS sensor during thermal vacuum testing. Corrected SW errors in algorithms calculating earth spin rate and line-of-sight projection to the ground.
- Led a small team to process 100's of gigabytes of data from more than 200 EMI sweeps during a five month EMI test. This included tool development, database design and implementation, data logging, report generation, shift scheduling, and skills training.

Section manager

- Responsible for performance feedback, career development, staffing, mentoring and training, and direct technical support for a team of 11 engineers. This team has supported algorithm development and implementation for electro-optical systems (tactical and space). Currently my team is focused on data analysis and requirements sell-off for the VIIRS sensor.

Education:

Ph.D., Mechanical Engineering

Summer 2003

- Thesis: Methods of comparing logic control design methodologies used in industrial programmable logic controller (PLC) programming

Master of Science, Mechanical Engineering

December 1999

University of Michigan

Bachelor of Science, Mechanical Engineering

June 1997

California Institute of Technology

Skills and tools:

Error analysis; controller design, analysis, troubleshooting; estimator design and implementation; test data organization, analysis, and reduction; analysis tool development
Matlab; Java; Subversion; mySql