

# Han-Hsun Jack Lu

hanhsun.lu@gmail.com | 979-255-2080

<https://www.linkedin.com/in/han-hsun-jack-lu/>

## BACKGROUND

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Experienced aerospace engineer and manager focused on commercial space system V&V. My technical areas of interest are flight software test and development, linear and nonlinear system identification, control theory, and dynamic modeling and simulation. I am experienced in configuration management and collaboration tools such as Git and JIRA, and also a strong believer of Agile SW development.

## PERSONAL

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Citizenship:

US Citizen

with Australia and Taiwan citizenship

## EXPERIENCE

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### **IV&V LEAD | ODYSSEY SPACE RESEARCH**

Houston, TX

Sep. 2018 - Present

Independent Verification and Validation for commercial space vehicles Duties include:

- Lead software engineers providing software technical guidance and project guidance.
- Direct interface with NASA and customer in weekly and monthly planning meetings.
- Support Software-In-the-Loop (SIL) testing
- Project tasking, scheduling, and planning
- Provide technical support for the team
- Risk analysis and mitigation
- FMECA analysis

### **FLIGHT TERMINATION SPECIALIST | ODYSSEY SPACE RESEARCH**

Houston, TX

Jan. 2020 - Present

Verification of various launch vehicles Duties include:

- Negotiate with Space Force and FAA to drive software changes to meet Range requirements
- Review manual and Autonomous Flight Termination System(AFTS) design specs, compliance evidence
- Help customers customize launch vehicle requirements

### **GNC FSW TEST LEAD | ODYSSEY SPACE RESEARCH**

Houston, TX

Sep. 2021 - Oct. 2022

Lead GNC FSW testing for Sierra Space Dreamchaser CRS2 project. Duties include:

- Lead a group of GNC test engineers to develop test scenarios while coordinating with FSW engineers
- Support Hardware-In-the-Loop (HIL) and Software-In-the-Loop (SIL) testing
- Act as SCRUM master to plan and manage Sprint priorities
- Direct and plan GNC FSW test cases/procedures
- Continuous integration testing infrastructure setup using Jenkins

### **NASA LANGLEY RESEARCH CENTER | STRUCTURAL DYNAMICS EXCHANGE SCHOLAR**

Hampton, VA

Aug. 2012 - Aug. 2013

- Structural Dynamics Branch

Provided simulation results and identified linear models of a heliogyro flexible solar sail. The work was used to analyze the feasibility of a small scale demonstration mission by deploying and controlling a spinning solar sail.

Conducted experiments using the 8-foot vacuum chamber to analyze the stability of flexible the solar sail beam in vacuum.

## EDUCATION

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### **TEXAS A&M UNIVERSITY | M.S. IN AEROSPACE ENGINEERING**

College Station, TX

Sep. 2015 - Dec 2017

- Advisor: Dr. John Valasek
- Thesis: Online Near Real-Time System Identification on Small Unmanned Aircraft Systems

- Advisor: Dr. Jer-Nan Juang
- Thesis: Robust Analysis of a Thin Spinning Membrane
- GPA: 4.0

## TECHNICAL INTERESTS

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Flight software development and testing	Sensor integration
System identification	Multi-agent control
Control law implementation	Vehicle simulation and modeling
Intelligent systems and flight autonomy	Vibrational modal analysis
Deep reinforcement learning	

## TECHNICAL SKILLS

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### PROGRAMMING

- Proficient in Python for mathematical estimation, microcontroller development, multiagent communication, and implementation of estimation and control algorithms through various project.
  - Advanced knowledge of mathematical packages SciPy, Numpy and Matplotlib.
  - Advanced knowledge of NASA Trick simulation environment
  - Project experience with machine learning packages Keras, TensorFlow, and Scikit-Learn.
- Proficient in MATLAB® / Simulink through nonlinear dynamical simulations for both spacecraft and air vehicles.
  - Experienced with Control Systems Toolbox, System Identification Toolbox, Aerospace Toolbox, and NASA analysis toolbox System/Observer/Controller Identification Toolbox (SOCIT), System IDentification Programs for AirCraft (SIDPAC).
  - Intermediate experience with structural modal analysis packages.
- Knowledge of C/C++ developed through the implementation of real-time robotics and communication (UDP/TCP protocols). Embedded systems development experience such as Arduino, BeagleBone Black, and Raspberry Pi.
- Advanced knowledge of UNIX shell scripting.

### SOFTWARE APPLICATIONS

- Experienced with common IDEs - Eclipse, Pycharm, VScode
- Experienced with continuous integration platforms - Gitlab, Jenkins
- Experienced with Atlassian tools - JIRA, Confluence, Bitbucket, Crucible
- Advanced knowledge of configuration management tools - Git, SVN.
- Strong knowledge of L<sup>A</sup>T<sub>E</sub>X for proposal and technical documents.
- Advanced knowledge of Mathematica for math derivations through flexible structure derivation experience.
- Past experience of SmartBear reviewing system.
- Past experience of MAVlink protocol.
- Knowledge of Labview for data acquisition and basic data analysis.
- Knowledge of GUI development - QT, Tkinter.
- Knowledge of IBM DOORS, Jama