Gavin Martin

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Education

The University of Texas at Austin
B.S., Aerospace Engineering (Honors)
Concentration: Space Flight
Dec 2019 | GPA: 3.81

Skills

Languages: Java • Python • Bash • Go • MATLAB
Libraries: Guava • Dagger • JUnit • NumPy • SciPy • Pytest
Technologies: AWS • Docker • Linux • GraphQL • SPICE • LaTeX
Interpersonal: Public Speaking • Project Management

Work Experience

Amazon, **Software Development Engineer II**, Remote (Irvine, CA) . . . . . May 2022 - Present
- Working on the Constellation Operations team for Amazon's Project Kuiper satellite constellation
- Designing and developing mission operations tooling for planning, execution, and automation use cases
- Building and maintaining hardware-in-the-loop test frameworks for functional and system-level satellite testing
- Developed automated test + mission ops reporting pipelines and dashboards using a variety of AWS services (S3, SNS, Lambda, Kinesis, Glue, Athena, QuickSight)

NASA Jet Propulsion Laboratory, **Software Systems Engineer**, Pasadena, CA . . . . . May 2020 - Apr 2022
- Led the Activity Planning Software Development Team for the Europa Clipper mission (10 members)
- Consulted on planning software development for the Mars Sample Retrieval Lander misison
- Designed and implemented models of spacecraft subsystems and instruments for use in planning software
- Socialized operations planning and software concepts to large audiences (60+) across a range of mission venues
- Mentored interns and trained them in engineering and software development best practices
- Supported assessments of evolving mission risks related to uplink software, scope, and schedule

NASA Jet Propulsion Laboratory, **Engineering Applications Software Eng.**, Pasadena, CA . Jan 2020 - May 2020
- Led the Activity Planning Software Development Team for the Europa Clipper mission (continued above)
- Developed automated translation support tools for migrating code from a JPL domain-specific language to Java

Raytheon / NASA JPL, **Software Systems Engineering Intern**, Remote (Austin, TX) . . . . . Apr 2019 - Dec 2019
- Collaborated in designing a multi-mission Java framework for spacecraft activity planning and mission simulation
- Developed a generic discrete event engine for simulating activity plans and predicting resource usage
- Integrated JPL's SPICE toolkit into the framework for modeling orbital dynamics and time systems

NASA Jet Propulsion Laboratory, **Mission Planning Intern**, Pasadena, CA . . . . . May 2018 - Aug 2018
- Optimized legacy Europa Clipper mission modeling and simulation software for speed, scalability, and reliability
- Automated mission simulation, mission plan analysis, and data delivery workflow using Jenkins and Docker
- Dockerized legacy tools to enable cloud compatibility and parallel software deployments

Texas Spacecraft Laboratory, **Seeker Vision Project Manager**, Austin, TX . . . . . Oct 2017 - May 2018
- Designed computer vision system for NASA JSC's Seeker mission (launched April 2019 on Cygnus NG-11)
- Directed 15+ person student development team through successful NASA reviews and flight software delivery
- Delivered vision system and FSW which outperformed that of a NASA-internal team
- Trained neural networks with TensorFlow to intelligently detect, recognize, and localize nearby vehicles in space

Texas Spacecraft Laboratory, **ARMADILLO Mission Manager**, Austin, TX . . . . . Mar 2017 - Nov 2017
- Constructed operations infrastructure to support the ARMADILLO CubeSat (launched June 2019 on STP-2)
- Integrated communication and project management platforms while scaling from 5 to 50+ engineers
- Spearheaded development of PyQt5 GUI to process and interpret downlinked spacecraft telemetry in real-time

GE Aviation, **Software Engineering Intern**, San Marcos, TX . . . . . May 2016 - Aug 2016
- Built custom enterprise resource planning software using Java's Swing framework
- Automated customer service reporting by integrating custom ERP software with the Apache POI API

Professional Honors & Awards

Voyager Award (Individual) | NASA Jet Propulsion Laboratory 2022
For implementing a proof of concept ...to resolve MOS issues with gathering ...activity definitions
Bonus Award (Team) | NASA Jet Propulsion Laboratory 2022
For excellence in rapidly assessing and safely responding ...to the Log4j security vulnerability
Team Award | NASA 2022
For excellence in developing comprehensive models and simulations for ...mission architecture and design decisions
Discovery Award (Individual) | NASA Jet Propulsion Laboratory 2021
For shepherding Europa Clipper adaptation of Merlin planning tool
Bonus Award (Team) | NASA Jet Propulsion Laboratory 2020
For contributions to the successful Europa Clipper PCE, MP S/W, and P&E S/W Peer Review
Voyager Award (Individual) | NASA Jet Propulsion Laboratory 2020
For foundational advancement of Europa Clipper and Aerie Merlin simulation and scheduling concepts
Above & Beyond Bronze Award | General Electric 2016

Academic Honors & Awards

Graduation with Honors | Cockrell School of Engineering 2019
Longhorn Poster Session Audience Favorite Award (1st Place) | UT Research Week 2019
Titled "Machine Learning in Space: Seeker 1's Intelligent Vision System" – `https://bit.ly/ML-in-space`
Tejas Scholarship Recipient | UT-Austin . . . . . 2017 - 2019
UT-Austin Engineering Honors Program | Cockrell School of Engineering . . . . . 2015 - 2019
Uniden Corporation of America Endowed Scholarship | Cockrell School of Engineering . . . . . 2015 - 2019
Class of 2019 Representative | UT Aerospace Department Advisory Board (LUNAR Council) . . . . . 2015 - 2019
Plan II Honors Program | UT-Austin College of Liberal Arts . . . . . 2015 - 2019
National Merit Scholar | National Merit Scholarship Corporation 2015

Publications

[1] C. Schubert, K. Black, D. Fonseka, A. Dhir, J. Deutsch, N. Dhamani, G. Martin, and M. R. Akella. A Pipeline for Vision-Based On-Orbit Proximity Operations Using Deep Learning and Synthetic Imagery. In *2021 IEEE Aerospace Conference*. 2021.

[2] N. Dhamani, G. Martin, C. Schubert, P. Singh, N. Hatten, and M. R. Akella. Applications of machine learning and monocular vision for autonomous on-orbit proximity operations. In *AIAA Scitech 2020 Forum*. 2020.

[3] M. Kumar, A. Rothstein-Dowden, and G. Martin. A Higher-Order Temporal Reasoning Approach to Authoring Semantically Precise Flight Rules for Spacecraft Systems. In *The 16th International Conference on Space Operations 2020*. 2020.

Projects

Seeker Vision – `https://bit.ly/seeker-vision`
- Developed spacecraft detection and relative bearing estimation system for NASA mission using deep neural nets
- Co-architected cloud-based ML pipeline for synthetic image generation, CNN training, and evaluation
- Tools: Python, TensorFlow, OpenCV, AWS

ADCS Simulator – `https://bit.ly/adcs-simulator`
- Developed object-oriented simulation engine for spacecraft attitude determination and control systems
- Can be used to demonstrate the viability of a specific suite of sensor, actuator, and controller designs
- Wrote research paper detailing models for dynamics, actuators, sensors, and control algorithms in simulator
- Tools: Python, NumPy, SciPy, Matplotlib, Sphinx, LaTeX