Duncan L. Miller

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INDUSTRY EXPERIENCE

Space Exploration Technologies – Guidance Navigation and Control Engineer — Hawthorne, CA
2015 – Present (Intern 2013)

- Develop fault tolerant navigation algorithms for launch vehicles and spacecraft
- Trajectory design, optimization, and dispersion analysis for Dragon rendezvous with the ISS
- Launch and mission operations support, including direct customer interface
- Experience in the field of inertial, optical, ranging and GPS sensor systems, fault management, rendezvous and proximity operations, and the software languages C++ and Python
- SpaceX Kick-Ass Award

– InSpace Propulsion Intern — McGregor, TX
Summer 2012

- Install and operate infrared camera system for rocket engine performance analysis

Lockheed Martin Space Systems – Spacecraft Mechanisms Intern — Sunnyvale, CA
Summer 2011

- Design hardware to quantify the hysteresis of flight hardware hinges
- Build wire harness for solar array slip-rings in TVAC; quantified satellite aging in storage
- Winner: One of the Top 5 Final Intern Presentations

NASA Langley Autonomous Vehicle Laboratory – Aerospace Controls Intern — Hampton, VA
Summer 2010

- Develop hardware-in-the-loop simulations of RC vehicles with FlightGear and hobby electronics
- Use quadrotors, infrared tracking cameras and DGPS to study autonomous 'sense and avoid' control algorithms with sentinel patrol of ground vehicles
- 1st Place Paper and Presentation, AIAA Region III Student Conference, Individual, 2011

RESEARCH EXPERIENCE

MIT SPHERES Team – Universal Docking Port Chief Engineer — Cambridge, MA
2013 – 2015

- Lead engineer for SPHERES UDP from requirements to ISS flight hardware delivery
- Implement real time fiducial tracking algorithm and hybrid estimator for relative navigation
- Architect C/C++ object-oriented software platform for the SPHERES Halo and science payloads

Michigan eXploration Lab –Attitude Determination and Control Team — Ann Arbor, MI
2011 – 2013

- Design and integrate Attitude Control Board (magetorquer and gyros) for MCubed-2 CubeSat
- Characterize orbit disturbances and CubeSat control using Matlab simulations

– CADRE Structures Team Lead — 2011 – 2012

- Custom CubeSat bus design, rapid prototyping, electrical integration, FEA, and thermal modeling
- CADRE Outstanding Performer; Team Award (Structures)

eXtendable Solar Array System, S3FL – Payload & Mechanisms Team — Ann Arbor, MI
2010 – 2011

- Redesign solar panel deployment from CubeSat; optimize deployable mechanisms
- 1st Place Presentation, AIAA Region III Student Conference, Team, 2011

Zero-g ElectroStatic Thruster Testbed Reflight, S3FL – Structures Lead — Ann Arbor, MI
2009 – 2010

- FEA analysis; electric propulsion thruster testing in vacuum and on NASA's "Vomit Comet"

EDUCATION

Massachusetts Institute of Technology – GPA: 5.0 /5.0 — Cambridge, MA
May 2015

- S.M. Aeronautics and Astronautics, thesis-based, controls and space systems focused
- Recipient of the NDSEG and NSF Graduate Fellowships

University of Michigan – GPA: 4.0 /4.0 (27 A+'s)

- B.S. Aerospace Engineering with a Minor in Multi-Disciplinary Design — Ann Arbor, MI
- Michigan Daily Student of the Year (2012), Shipman Scholar (full ride), George M. Landes Prize in Technical Writing (2013), Distinguished Leadership in the College of Engineering (2013) — May 2013

SKILLS

Programming: Matlab ▪ C++ ▪ Python ▪ LaTeX ▪ Linux native environment
Software: SolidWorks ▪ Altium ▪ OpenCV ▪ Satellite Toolkit ▪ ANSYS ▪ Nx ▪ LabView
Hardware: Ultra high vacuum experience ▪ Pumps/Valves/Instrumentation ▪ Test operation experience (with hypergols)
Manufacturing: Geometric Dimensioning and Tolerancing ▪ Mill ▪ Laser cutting ▪ TIG welding ▪ Basic shop tools

OTHER ACTIVITIES

Mars Initiative [Community Leader], MIT Space Balloon Team [Co-Founder, Co-Lead] ▪ ΣΓΤ Aerospace Honor Society [President] ▪ 2014 Michigan Aero Centennial [Student Lead] ▪ Amateur Radio License ▪ International Science Fair 2007