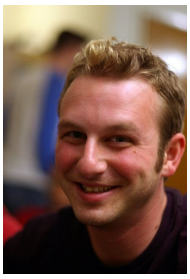

Michael Ricks-Aherne

Aerospace / Full Stack Engineer

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Experience

2011 - 2015 — **Planet Labs** — San Francisco, CA

Senior Avionics and Software Engineer

As one of the first dozen employees at Planet, I wore many hats, moving from the Spacecraft team to Mission Operations and finally to Manufacturing and Production. I've most likely transitioned (started-and-handed-off) more code than anyone else in the company. All told, I had an active role in designing, building, testing or flying all of Planet's 113 satellites. Selected highlights:

- Designed and developed 2/3 of the microcontroller code for our first spacecraft and significant portions for our second. This code handled power, inter-processor communication, scheduling, sensor acquisition, telemetry and commands.
- Implemented the camera software responsible for the first 10,000 photos.
- Started and maintained the company's continuous integration and deployment system.
- Co-started and maintained the company's code review system.
- Promoted to Lead the Mission Operations team through Flock 1a.
- Architected/programmed large portions of Mission Control (Django on Postgres with many periphery systems: Nagios, Redis, New Relic, RabbitMQ and others).
- Drove long-term strategy of team composition. Gave performance reviews, interviews and managed employee lifecycle before we had an HR department.
- Expanded remote worker infrastructure by evangelizing ChatOps.
- Co-lead software development for Manufacturing and Production.
- Added frontend unit testing to Production's CI process.
- Mentored several interns and new hires across multiple teams.
- Gave tours to distinguished guests and coworker's families (one of my favorite parts of the job).
- Promoted cross-team solutions, like factory reset and SatCloud, to address global optimization problems.
- Actively shaped company culture, advocating for the artist-in-residence program both inside and outside the office.

2014 - 2015 — **Hackbright Academy** — San Francisco, CA

Volunteer Mentor, 2 semesters

2007 - 2011 — **Information Sciences Institute** — Marina Del Rey, CA

Research Satellite Engineer, Space Engineering Research Center

Designed guidance, navigation and control systems and managed students on several microsatellite research programs. Selected accomplishments:

- Programmed, solely, the entire flight software system for USC's first Cubesat, launched December 8, 2010 aboard SpaceX's Falcon 9 rocket. (see Publications #1)
- Implemented the attitude control system for the first-ever surface tracking Cubesat, launched in July 2012. (see Publications #2)
- Published research on rendezvous and proximity operations using a vision-based autonomous tracking system. (see Publications #3)
- Designed and programmed the control systems for thruster-based microsatellite prototypes, involving Kalman filtering, computer-assisted docking and PID and phase plane controllers.
- Developed functional and environmental test requirements for the Aeneas Cubesat program and served as Integration and Test Director.
- Created an Application Programming Interface (API) for commanding microsatellites over a wireless TCP/IP network using a Rabbit 4000 microcontroller.
- Managed both graduates and undergraduates as acting Systems Engineer.
- Designed the SERC website and created/maintained most pictures and videos of the program.

2006 - 2009 — **Stinger Ghaffarian Technologies (SGT)** — Upper Marlboro, MD

Systems Engineer, Mission Systems Engineering

Managed NASA Goddard Space Flight Center's Requirements Database and designed satellite propulsion subsystems. Selected accomplishments:

- Created automated tools to help with propulsion subsystem design, including tank sizing, plume impingement considerations, delta-v budgeting and cost/weight estimations.
- Implemented significant cost savings through autonomous linking of requirements, and developed tools for parsing, characterization and trace development.
- Telecommuted for 2 years, receiving high praise on deliverables and performance evaluations.

2003 - 2006 FAA Office of Commercial Space Transportation Washington, DC

Aerospace Engineer, Licensing And Safety Division

Managed and oversaw amateur rocket launches and regulation development. Supported safety analyses for license and permit applications, including both quantitative and qualitative risk assessments. Performed on-site safety inspections and compliance monitoring. Selected accomplishments:

- Maintained flawless safety record of the amateur rocket community.
- Drove final team concurrence on regulations that had been stalled for 12 years. (see Publications #4)
- Cut $100,000 in costs through prudent contract management.
- Elected by colleagues as Employee of the Year, elected by management as Top Performer.
- Experienced with all Range Safety analyses, including:
  - 6-degree-of-freedom trajectory simulation, dispersion and malfunction turn analyses
  - Blast overpressure calculations, damage modeling, debris generation and fragmentation distance
  - Probability-of-impact and cumulative risk assessment
  - FMECA, Fault Tree Analyses, Hazard Analyses

SKILLS

Software proficiencies:

- Backend: Redis, Memcache, Celery, RabbitMQ, Nagios
- Build/CI: Jenkins, Ansible
- CAD: AutoCAD, Microstation, CATIA, Pro/E, Solid Works
- Database: MySQL, Postgres
- Languages/Libraries: Visual Basic, C/C++, Python, Javascript/Jquery, OpenCV
- Mathematics: MatLab, Maple, MatrixX
- Metrics: Logstash/Elasticsearch/Kibana, Graphite, D3/Highcharts, New Relic
- MVC: Django, Backbone
- Simulators: LabView, Simulink, SystemBuild
- Specialized applications: OrSAT, POST, STK, Splash, TaOS
- Virtualization: Vagrant, OpenStack, AWS
- Testing: Unittest, Jasmine, Check, Boost
- Graphics and Video: Photoshop, After Effects, Gimp, MS Movie Maker

Miscellaneous experience:

- Machining: Riveting, gas welding, Dremel work, composite layups, hot-wire foam cutting and soldering.
- Graphic Design: Created promotional videos and photographs for USC microsatellite projects. Designed flyers for the Space Engineering Research Center and the National Skate Patrol.

PUBLICATIONS

(1) "Caerus – Concept through Flight in Eleven Months: A Story of Rapid Response and Lessons Learned."
J. Tim Barrett, Michael Aherne, Will Bezouska, Jeff Sachs and Lucy Hoag, AIAA-2011-713. Presented at the 2011 AIAA Space Conference, Pasadena, CA.

(2) "Colony I Meets Three-Axis Pointing."
M. Aherne, T. Barrett, L. Hoag, E. Teegarden, R. Ramadas, SSC11-XII-7. 2011 Utah Small Satellite Conference.

(3) "Demonstration of Beam Assembly with Autonomous Micro-Satellite Prototypes."
M. Aherne, T. Barrett, W. Bezouska and S. Schultz, AIAA-2009-6504. Presented at the 2009 AIAA Space Conference. Pasadena, CA.

(4) "Requirements for Amateur Rocket Activities."
Federal Aviation Administration. RIN 2120–2120–AI88. Federal Register, Vol. 73, No. 234 / Dec 4, 2008.

EDUCATION

University of Southern California Los Angeles, CA

M.S. Astronautical Engineering

- Interdisciplinary coursework in control systems, robotics, filtering, estimation, mobile robot architectures and artificial intelligence.
- Noteworthy academic projects:
  - Path planning program (using A* search) for course in Artificial Intelligence
  - Sound localization using 3 microphones and LabView for "Sensing and Planning in Robotics" course
  - GNC engineer for LEAPFROG project – a hovering jet-based lunar-lander. First flight in March 2009.

Embry-Riddle Aeronautical University Daytona Beach, FL

B.S. Engineering Physics. Minor in Mathematics

- Senior Design team placed 1st and 3rd in two separate competitions for designing a reusable cargo shuttle between Earth and Mars.
- Junior design team competed in NASA's 9th annual Great Moonbuggy Race.
- Recipient of the "Most Outstanding Student" Award.
- First engineering student to study abroad in Australia.

PERSONAL

Certified Rollerblading Instructor, SCUBA diver, Snowboarder, Drummer, Hiker, Amateur Photographer.