Michael Ricks-Aherne

Software. Aerospace. Leadership.

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Dual US/Irish Citizen
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Experience

2015-2016

Sauce Labs — San Francisco, CA

Senior Software Engineer

Sauce Labs provides a platform for automated testing of web and mobile applications. I am responsible for many aspects of the Continouos Integration (CI) pipeline. Selected accomplishments:

- Revolutionized internal CI process within 2 months of starting and received a bonus for my efforts.
- Helped automate dev-environment creation. *[Ansible, Packer with QEMU Builder]*
- Promoted within 6 months to work directly under the Founder/CTO on CI.
- Developed cross-disciplinary solutions across multiple teams and repos. *[Python, Angular, Coffeescript, Groovy]*
- Received praise for consistent work on documentation, meeting notes and paying tech debt.
- Contributed in non-technical ways to the Sauce culture:
  - Participated in the Values Task Force, a team to shape and guide Sauce's values.
  - Constructed a large (G-motor) Sauce-branded amateur rocket.
- Worked remotely from St. Louis.

2012 - 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 probably 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 113 satellites. Selected accomplishments:

- 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. *[C on PIC, then C on ARM]*
- Implemented the camera software responsible for the first 10,000 photos taken from orbit. *[C++ on SBC]*
- Started and maintained the company's continuous integration and deployment system. *[first Vagrant/shell scripts, then Jenkins/Ansible on OpenStack, finally Jenkins/Ansible on AWS]*
- Co-started and maintained the company's code review system. *[Redmine, then Phabricator]*
- Promoted to Lead the Mission Operations team through Flock 1a.
- Architected/programmed large portions of Mission Control. *[Python/Django on Postgres, with monitoring (Nagios, New Relic and ElasticSearch), satellite tasking (Celery and RabbitMQ), caching (Memcache and Redis), and user interfaces (Javascript/Jquery/D3/High Charts/Graphite/Bootstrap and Backbone)]*
- 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. *[HipChat/Coffeescript]*
- Co-lead software development for Manufacturing and Production. *[REST API in Python/Flask, website in Python/Django, GSE in Arduino/RaspberryPi]*
- Added frontend unit testing to Production's CI process. *[Backbone/Jasmine]*
- Mentored several interns and new hires across multiple teams.
- Actively shaped company culture, advocating for the unique artist-in-residence program.

2007 - 2012

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) *[C on PIC]*
- Implemented the attitude control system for the first-ever surface tracking Cubesat, launched in July 2012. (see Publications #2) *[C on PIC, MatrixX/Simulink on Windows]*
- Published research on rendezvous and proximity operations using a vision-based autonomous tracking system. (see Publications #3) *[OpenCV and HAAR classifiers]*
- Refactored Mission Control as a website *[PHP/MySQL]*.
- Designed and programmed the control systems for thruster-based microsatellite prototypes, involving Kalman filtering, computer-assisted docking and PID and phase plane controllers. *[C on Rabbit]*
- 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. *[C on Rabbit]*
- Managed both graduates and undergraduates as Systems Engineer.

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 tools to help with propulsion subsystem design, including automated tank sizing, plume impingement calculations, delta-v budgeting and cost/weight estimations. *[Visual Basic]*
- Implemented significant cost savings through autonomous linking of requirements and developed tools for parsing, characterization and trace development. *[Visual Basic]*
- Worked remotely 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

Oversaw amateur rocket launches and regulation development. Conducted safety analyses for license and permit applications. 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, cumulative risk assessment
  - FMECA, Fault Tree Analyses, Hazard Analyses
  - *[Technologies used: POST, OrSAT, STK, Splash, TaOS, Maple, Visual Basic]*

SKILLS

Summarized software experience:

- **Automation/Build/CI**: Jenkins, Ansible, Celery
- **CAD**: AutoCAD, Microstation, CATIA, Pro/E, Solid Works
- **Cloud**: AWS EC2/S3
- **Database/Storage**: MySQL, PostgreSQL, Redis, Memcache
- **Frontend**: Angular, Django, Backbone
- **Graphical Programming**: LabView, Simulink, SystemBuild
- **Languages**: Visual Basic, C/C++, Python, Javascript, Coffeescript, Groovy,
- **Mathematics**: MatLab, Maple, MatrixX
- **Metrics**: Logstash/Elasticsearch/Kibana, Nagios, Graphite, D3/Highcharts, New Relic, Sumologic
- **Specialized Application/Libraries**: OpenCV, OrSAT, POST, STK, Splash, TaOS
- **Virtualization**: Vagrant, OpenStack, Docker, Kubernetes
- **Graphics and Video**: Photoshop, After Effects, Gimp, MS Movie Maker, OpenShot, Scribus

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 and artificial intelligence.

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.
- Recipient of the "Most Outstanding Student" Award.

PERSONAL

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