Nathaniel Guy

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Education

University of Washington (Overall GPA: 3.77/4.00) **Seattle, WA**

Master of Science in Aeronautics & Astronautics — Expected graduation: March 2016

- Focus on control systems and autonomous systems for space-related applications.
- Coursework includes: Control in Aerospace Systems, Linear Systems Theory, Networked Dynamics Systems, Mechanics of Composite Materials, High-Performance Scientific Computing, and Rocket Propulsion.

Master of Science in Computer Science — Received June 2015

- Coursework included: Computer Vision, Networks, Graphics, Distributed Systems, and Data Visualization.
- Graduate Teaching Assistant: Software Engineering, Networks, and Graphics.

Georgetown University **Washington, DC**

Bachelor of Science in Computer Science; Bachelor of Arts in Japanese — Received May 2005

Experience

Hakuto Google Lunar XPRIZE Team **Sendai, Japan**

Masters Intern, UI/Ground Station Software Engineer — July 2015–December 2015

- Principal developer for ground station software to support teleoperation and telemetry analysis for upcoming lunar rover exploration mission. In little over a month, took a rover ground station from the concept phase to a fully operational product capable of carrying out a week of field tests without major issues.
- Wrote code to run on the rover during mission operation for telemetry processing and device output parsing, motor control system operation, and other tasks.
- Set up rover operation environment and operated rover in lunar-like conditions, relying on rover telemetry to make decisions to achieve mission goals while maintaining safety.
- Designed new PID controller for rover motor control. Implemented controller in C++ on a microcontroller running RTOS, and tuned gains empirically to maximize traction on regolith-like surfaces.
- Worked closely with other software engineers to plan out full software system design.
- Developed and improved various higher-level systems related to mission operation and assurance, including advanced systems for fault detection, isolation, and recovery.

SpaceX, Flight Software **Hawthorne, CA**

Flight Software Intern — September 2014–December 2014

- Wrote, maintained, and executed hardware- and interface-specific tests on the testbeds for Dragon system V&V.
- Analyzed and improved testing of FDIR (fault detection, isolation, and recovery) systems for Dragon spacecraft.
- Automated NASA verification tests for launch. Turned a 20+ hour manual process into a fully-automated one, increasing comprehensiveness and reducing execution time to around 3 hours.
- Integrated, qualified and maintained a high-fidelity, hardware-in-the-loop testbed.
- Troubleshooted testbed issues, including harnessing, computer hardware, software, electrical and RF systems.
- Executed tests on the Dragon flight vehicle at the launch site.

NASA Jet Propulsion Laboratory, Human Interfaces Group **Pasadena, CA**

Software Engineering Intern — June 2014–September 2014

- Developed an intuitive and innovative 3D interface for robotic calibration and manipulation. This interface permits extremely fast calibration of sensors and manipulator position (on the order of 30 seconds), and allows precise manipulation in dynamic environments with an easily expandable library of objects and interaction methods. Specifically, I focused on the development of the camera calibration code, robotic manipulation code, and user interface code.

Nintendo of America, Software Development Support Group **Redmond, WA**

Senior Bilingual Software Engineer — June 2005–January 2007; November 2009–August 2013

- Assisted other developers through all stages of the game development process, including extensive debugging and troubleshooting, development of whitepapers, creation of tools, and assistance publishing games and DLC.
- Researched techniques to utilize controllers incorporating 3D inertial sensors, as well as visualization techniques to improve the development process. (See "Patents" section.)
- Collaborated with many third parties, including a major space organization, on a variety of development projects.

Freelance Japanese Translator — 2005–2009

- Translated several high-profile video game titles, as well as assorted technical and business-related documents.

Technical Skills

- Programming Languages: C++, C, Python, C#, MATLAB, Java, Javascript/HTML5, PHP.
- Platforms: PC, Mac OS X, Linux/UNIX, Nintendo DS/3DS/Wii/Wii U, Arduino.
- Tools: Microsoft Visual Studio, Git, Mercurial, Subversion, Vim, Simulink, CEA, LaTeX, etc.
- Frameworks/Libraries: Unity, SciPy, OpenCV, OpenGL, SDL, and proprietary Nintendo libraries.

Languages

- Fluent in Japanese and Spanish, including technical vocabulary. Proficient in French.

Invited Talks and Posters

- **"PID Control Fundamentals."** Tohoku University, Space Robotics Lab, Sendai, Japan, October 2015.
- **"3D Telepresence Interface for Robotic Manipulation."** Tohoku University, Space Robotics Lab, Sendai, Japan, August 2015.
- **"Better Tools for Fault Diagnosis in Complex Systems."** University of Washington, Data Visualization Research Night, Seattle, WA, May 2015.
- **"Better Tools for Fault Detection, Isolation, and Recovery."** University of Washington, RAIN Lab, Seattle, WA, May 2015.
- **"Arduino Programming Basics."** University of Washington, CoMotion MakerSpace, Seattle, WA, March 2015.
- **"Flight Instruments."** University of Washington, UWAA Pilots, Seattle, WA, March 2015.
- **"Flocking."** University of Washington, Computer Science and Engineering Algorithms Club, Seattle, WA, May 2014.
- **"Automating your life: Arduino hacking for fun and profit (but mostly fun)."** University of Washington, Sudo Soldiers, Seattle, WA, April 2014.
- **"Game Industry Basics."** University of Washington, Control Systems Labs, Seattle, WA, November 2013.

Patents

- U.S. Patent No. 8,516,467: "Method and Apparatus for Enhancing Comprehension of Code Time Complexity and Flow." Issued August 20, 2013.
- U.S. Patent No. 8,147,333: "Handheld control device for a processor-controlled system." Issued April 3, 2012. (My name was mistakenly left off the patent, but is on an attached corrections sheet.)

Awards and Certifications

- Andris Vagners Memorial Fellowship recipient (Fall 2013, from UW Aeronautics & Astronautics department)
- Bob Bandes Teaching Award Honorable Mention (Spring 2014, from UW Computer Science department)
- Passed Japanese Language Proficiency Test (JLPT) Level 1 (Winter 2005)

Interests

- Creator of the annual SEAHOP puzzle competition. 3 years running, with ~150 participants in 2013.
- Teach Arduino workshops at UW's student makerspace.
- Recreational programming: see screenname "NattyBumppo" on GitHub and Project Euler.
- Amateur astronomy, cycling, hiking, and wildlife foraging.

Other Links

- Personal website (with lots of project details): http://www.natguy.net
- GitHub page: https://github.com/NattyBumppo/