Audrow Nash

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Education

08/15 - present   **University of Michigan (U-M)**, *Ann Arbor*, Michigan, USA.
Master of Science in Electrical and Computer Engineering with expected graduation in May 2017
GPA: 3.5/4.0
Courses: Linear systems, robotic systems lab, computer vision, dynamics, machine learning

08/10 – 12/14   **University of North Carolina at Charlotte (UNCC)**, *Charlotte*, North Carolina, USA.
Bachelor of Science in Electrical Engineering
GPA: 3.5/4.0
Courses: Engineering simulation, embedded system design, sensors and actuators

Awards and Scholarships

2016   **National Science Foundation (NSF) Graduate Fellowship**.

2013   **Charlotte Research Scholars Fellowship**.

Skills

Programming   *Competent* in Common Lisp, $C/C++$, Python, Matlab; *Familiar* with Mathematica, Bash.

Software   *Competent* with Linux/Unix systems, GIT, LaTeX, GDB; *Familiar* with AutoDesk, LCM.

Hardware   *Competent* with oscilloscope, multimeter, 3D printers, laser-cutter, CNC machine, soldering iron; *Familiar* with motion-capture systems, reflow soldering oven, casting silicone.

Experience

05/15 – present   **Research Assistant**, *U-M*, Ann Arbor, Michigan, USA.
Currently, I have been building from scratch a general 2D physics simulator for the RAM-Lab. This simulator is used to simulate the RAM-Lab's walking robots, such as RAMone. We chose to build our own simulator rather than using anything an open-source or commercial simulator because we could design the simulator to be problem specific and thus faster, as well as have greater control over the assumptions made when designing the simulator.

- Devised an iterative way of satisfying the simulated system's constraints. This allowed the simulator to work for any number of frictional contact points.
- Wrote the full simulator in Matlab, then C++ for a 200x speed increase.
- Wrote the simulator in C++ to interface with Matlab as a Mex binary file.

Previously, I worked in the APRIL lab to extend Professor Edwin Olson's method of matching laser scans, called "scan matching," to images. In this work, I used a Lepton Flir thermal camera and a 32-bit ARM microcontroller to create a small, inexpensive, and low-power system for person detection. This method could also be used for object and landmark detection. The APRIL Lab planned to use this work on unmanned aerial vehicles for localization as well as person detection for ground robots and autonomous vehicles.

- Built a C statistics library for finding the mutual information between images.
- Reflow soldered embedded circuit board for ARM microcontroller and Lepton FLIR thermal camera.

02/15 – 08/15   **Intern**, *senseFly*, Cheseaux-Lausanne, Vaud, Switzerland.
- Designed and implemented a scale- and rotation-invariant object recognition system for drones to detect a landing pad. Used FAST detector and descriptor, SIFT-like octals for scale-invariance, and vector correlation to match features. Implemented without existing libraries to meet our specific needs.
- Implemented an algorithm to solve for a camera's intrinsic parameters; the obtained camera model was used to relate different cameras position and for visual SLAM. (My implementation was used for calibration in mass production.)

05/13 – 12/14   **Research Assistant**, *UNCC*, Charlotte, North Carolina.
- Worked towards having quadrotors establish and hold a formation (using only on-board sensing and processing); planned algorithm, picked out hardware, implemented. (Successfully implemented on quadrotors by my teammates after I graduated from UNCC.)
- Led team with three graduate students (while an undergraduate) (01/14 – 12/14).
- Presented research several times, including at the ICINCO conference in Vienna, Austria.

09/11 – 10/12   **Co-Founder and Partner**, *Sortastitious Longboards*, Charlotte, North Carolina.
I co-founded a company manufacturing and selling longboards (cruising skateboards). We were novel because we embedded electronics (hall effect sensor, IMU, LEDs, etc.) into longboards. I sold my part of the company to the other co-founder to focus on my studies. Profits surpassed expenses.

06/11 – 8/11   **Intern**, *DRS Technologies*, Bridgeport, Connecticut, USA.
I designed and used testing fixtures to verify function of Navy submarine electronics.

Extracurricular Activities

03/14 – present   **President and Interviewer**, *Robots Podcast*.
- Leader of international team (in USA, Australia, Japan, UK, Sweden, Russia). Streamlined, built in redundancy, and delegated the podcast publication pipeline. Created a tree-structure apprenticeship system for training new interviewers.
- Funded to attend international conferences several times a year (twice in 2015, three times in 2016). Established relationship with and was funded by Skolkovo and the Russian government to attend IASP 2016 conference in Moscow, Russia.
- Conducted 80+ interviews with leaders in robotics for *Robots Podcast* (1,800 global subscribers), which are featured on *Robohub* (85,000 unique monthly visitors).

08/11 – 10/12   **President and Chapter Founder**, *National Society of Leadership and Success*, Charlotte, North Carolina, USA.
I founded a chapter of a leadership and honor society that grew to approximately 1,000 members while I was president. I organized and led events with between 100–400 people approximately twenty times over one year. These events these often involved participation. To build an eight person executive board, I devised a way for members to apply online and interviewed the top applicants. I mentored the next president before passing on the position. By that time, we had events organized a year in advance.

07/07   **Ambassador**, *People to People*.
I was selected along with thirty other USA high school students to represent the United States in a trip to Australia. The experience included a week-long home-stay with a family near Sidney and several short presentations to Australian high school students.

Publications

09/14   **ICINCO**, Towards Establishing and Maintaining Autonomous Quadrotor Formations.
(first author)

03/14   **IEEE SoutheastCon.**, Establishing and Maintaining Formations of Mini Quadrotors.
(first author)