Nicholas Selby
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EDUCATION

Massachusetts Institute of Technology • Ph.D. Electrical Engineering and Computer Science **June 2021**
Massachusetts Institute of Technology • M.S. Mechanical Engineering **June 2018**
Georgia Institute of Technology • B.S. Mechanical Engineering • Mathematics Minor • Highest Honors **May 2016**

SELECTED EXPERIENCE

Massachusetts Institute of Technology, Cambridge, MA *Research Assistant since January 2018*

- Innovating in **advanced manufacturing** workforce development by building robotic education platform
- Developed novel, cloud-based "TeachBot" system with ROS and Node.js, **patent pending**
- **Submitted** work to subject-specific international conference
- Research presentation **won First Place** at MIT research exhibition

MIT Media Lab, Cambridge, MA *Research Assistant, August 2016 – December 2017*

- Innovating in **wireless networking technologies** to enable accurate sensing using wireless signals
- Developed novel drone-mounted wireless communication relay for warehouse inventory control, **patent pending**
- Created new signal processing techniques, **outperforming state-of-the-art by 20x**
- **Published** and demonstrated work at two subject-specific international conferences

Brown Water Laboratory, Atlanta, GA *Research Assistant, Summer 2016*

- Implemented **machine learning** algorithms for **public health** applications
- Developed **novel, low-cost PCB** device monitoring water quality for deployment in developing countries
- **Wrote software** for novel infant anthropometric device for deployment in USAID sites worldwide
- Deployed low cost disease vector tracking device in Mozambique using **computer vision**

Airdash, LLC, Atlanta, GA *Founder, May 2015 – May 2016*

- **Launched startup with $20,000** seed funding developing high altitude wind turbines
- Created **CFD** model of turbine to optimize aerobody shapes
- **Prototyped** 7 ft. diameter scale model for **wind tunnel testing** of aerodynamics and stability
- **Worked directly with stakeholders** such as Georgia Power, the State Department, and the Kenyan government

Georgia Institute of Technology, Atlanta, GA *Research Assistant, August 2014 – July 2016*

- Studied nonlinear acoustic waves using **MATLAB** and experimentation with **laser and transducer technology**
- **Developed novel technique** to calibrate equipment measuring integrity of structures
- **Published** and defended work at subject-specific national conference

Sandia National Laboratories, Albuquerque, NM *Research Assistant, Summer 2013*

- **Designed, prototyped, and demonstrated** novel *fractional quantum hall effect* sensor for use in quantum physics
- Simulated with **MATLAB and CAD** software and manufactured with **CNC machining**
- **Published** article in *American Institute of Physics* journal, *Review of Scientific Instruments*

Jet Propulsion Laboratory, Pasadena, CA *Research Assistant, May 2013 – May 2014*

- **Constructed hexacopter** drone for topographical mapping
- Compiled data on power systems for **glacial, deep-sea, volcanic, and asteroid robotics**
- Generated power system options overview analysis for **presentation and publication**

PUBLICATIONS, PATENTS, & CONFERENCE PRESENTATIONS

Y Ma, **NS Selby**, and F Adib. "Full-duplex, bi-directional, analog relay." U.S. Patent No. 10,389,429. 20 Aug. 2019.

Y Ma, **NS Selby**, and F Adib. "Methods and Apparatus for Wideband Localization." U.S. Patent Application No. 15/936,078, filed March 26, 2018.

Y Ma, **NS Selby**, and F Adib, "Minding the Billions: Ultra-wideband Localization for Deployed RFIDs," *ACM Annual International Conference on Mobile Computing and Networking*, Snowbird, UT, USA, 2017.

Y Ma, **NS Selby**, and F Adib, "Drone Relays for Battery-Free Networks," *ACM Conference on Applications, Technologies, Architectures, and Protocols for Computer Communication*, Los Angeles, CA, USA, 2017.

D Torello, **NS Selby**, J Kim, J Qu, and LJ Jacobs, "Determination of Absolute Material Nonlinearity with Air-Coupled Ultrasonic Receivers," *Ultrasonics*, 2017.

NS Selby, D Torello, JY Kim, LJ Jacobs, "Calibration of Air-Coupled Transducers for Absolute Nonlinear Ultrasonic Measurements," *Review of Progress in Quantitative Nondestructive Evaluation*, Atlanta, GA, USA 2016.

D Torello, **NS Selby**, J Kim, J Qu, and LJ Jacobs, "Determination of Absolute Material Nonlinearity in Aluminum and Fused Silica with Air-Coupled Ultrasonic Receivers," *Review of Progress in Quantitative Nondestructive Evaluation*, Atlanta, GA, USA 2016.

NS Selby, M Crawford, L Tracy, JL Reno, and W Pan, "in-situ Biaxial Rotation at Low Temperatures in High Magnetic Fields," *Review of Scientific Instruments,* 85, 095116 (2014); doi: 10.1063/1.4896100.

NS Selby and N Daley, "Simulation and Optimization of Car Design," *ASME 2014 International Design & Engineering Technical Conferences & Computers & Information in Engineering Conference*, Buffalo, NY, USA, 2014.

AWARDS

First Place Presenter. *MIT Mechanical Engineering Research Exhibition*. 2019.

National Science Foundation Graduate Research Fellowship Honorable Mention. *NSF*. 2016.

Best Oral Presentation. Undergraduate Research Symposium. *Georgia Institute of Technology*. 2016.

Richard K. Whitehead Jr. Memorial Award. Awarded to **top three** ME seniors. *Georgia Institute of Technology*. 2016.

President's Undergraduate Research Award. *Georgia Institute of Technology*. 2015.

Air Products Undergraduate Research Award. *Air Products and Chemicals, Inc.* 2015.

Best Utility Simulation for Product Design. *American Society of Mechanical Engineers*. 2014.

Stamps President's Scholarship. Merit-based, full cost of attendance scholarship **to top 12 of 14,000** applicants. 2012.

SKILLS

Programming	Python (incl. TensorFlow, ROS, NumPy), C/C++ (incl. OpenCV), C#, Java (incl. Android), MATLAB and Simulink, JavaScript (incl. Node.js), HTML/CSS, LabVIEW
Prototyping	CAD, FEA, CFD, PCB design, Soldering, CNC and Conventional Machining, MIG and TIG Welding, Waterjet Cutting, Laser Cutting, Plasma Cutting, 3D Printing
Miscellaneous	Robotics and Control, Machine Learning, Networking, DFMA, Public Speaking, Teaching