James D. Rosenthal

CONTACT INFORMATION

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EDUCATION

University of Washington Seattle, WA

Ph.D. candidate in Electrical Engineering **June 2018 - Present**
Research: High rate, ultra-low power backscatter communication systems
Advisor: Professor Matt S. Reynolds

- National Science Foundation Graduate Research Fellow

M.S. in Electrical Engineering: 3.93/4.00 GPA **September 2016 - June 2018**

- Course work: Microwave design, Analog & Digital Comms, Antenna Design, Software-Defined Radio Systems
- Teaching Assistant: Introduction to Digital Design, Technical Writing & Communication, Advanced Topics in Communications

University of Minnesota-Twin Cities Minneapolis, MN

B.S. in Electrical Engineering: 3.74/4.00 GPA **August 2013**

EXPERIENCE

NASA Langley Research Center Hampton, VA

Electrical Engineer **September 2013 - June 2018**
Electrical instrumentation engineer with an emphasis on designing avionics for radiation dosimetry.

- Avionics Subsystem Lead Engineer for the Radiation Dosimetry Experiment (RaD-X) stratospheric balloon project
- Avionics Subsystem Lead Engineer for the On-orbit Autonomous Assembly of Nanosatellites (OAAN) project
- Electronics Hardware Engineer for the Langley Autonomy Incubator

Synapse Product Development Seattle, WA

Electrical Engineering Intern **January - May 2013**
Design and testing role as part of a consumer product consultancy firm

- Designed hardware and software to improve testing times at mid-volume manufacturers
- Experimentally evaluated GPS antenna for a sports-watch manufacturer in order to improve GPS accuracy and reduce lock-on times

Airbus Toulouse, France

Engineering Intern, Dept. of Avionics Products and Digital Architecture **May - December 2012**
Research project focused on constructing a digital wireless demonstrator for future testing applications.

- Developed and demonstrated a CDMA wireless (de)coding algorithm implemented in VHDL and C code
- Furthered project management skills and cross-cultural communication ability

University of Minnesota UAV Research Group Minneapolis, MN

Research Assistant **May 2011 - May 2012**
July-September 2009
Research assistant responsible for flight testing and implementation of avionics in unmanned research

aircraft

- Characterization of the aerodynamic coefficients of an airframe through wind tunnel tests
- Utilized Matlab/Simulink and C++ to implement, test, and evaluate a GPS waypoint tracking controller in an unmanned research aircraft
- Test-pilot responsible for conducting flight tests and reporting the results to superiors

University of Arizona Neurorobotics Laboratory, Tucson, AZ

Research Assistant **May-August 2010**

Constructed, programmed, and debugged robots designed to test human walking algorithms

- Calibrated step-motors and actuators to improve precision of robotic joints
- Programmed in C to establish I2C communication with pressure sensors in the robot's feet

Aker Solutions, Tucson, AZ

Engineering Intern **June-August 2008**

- Wrote software to analyze the cost effectiveness of chemical plants in the USA and abroad
- Developed understanding of engineering consulting with domestic and international partners

Publications

- **J. Rosenthal**, M.S. Reynolds, "A 158 pJ/bit 1.0 Mbps Bluetooth Low Energy (BLE) Compatible Backscatter Communication System for Wireless Sensing," *IEEE Topical Conference on Wireless Sensors and Sensor Networks (WiSNet)*, (accepted).
- A. Dadkhah, **J. Rosenthal**, M.S. Reynolds, "ZeroScatter: Zero-Added-Component Backscatter Communication using Existing Digital I/O Pins," *IEEE Topical Conference on Wireless Sensors and Sensor Networks (WiSNet)*, (accepted).
- **J. Rosenthal**, A. Sharma, E. Kampianakis, and M.S. Reynolds, "A 6.25 Mbps, 12.4 pJ/bit DQPSK Backscatter Wireless Uplink for the NeuroDisc Brain-Computer Interface," *IEEE Intl. Conf. Biomedical Circuits and Systems, 2018.*
- A. Sharma, E. Kampianakis, **J. Rosenthal**, A. Pike, A. Dadkhah, and M.S. Reynolds, "Wideband UHF DQPSK Backscatter Communications in Reverberant Cavity Animal Cage Environments," *IEEE Trans. on Antennas and Propagation.*, (under revision).
- **J. Rosenthal**, B. Hayes, and C. Mertens. "A Silicon Micro Dosimeter for High-Altitude Measurements of Cosmic Radiation." in Proceedings of the IEEE Aerospace Conference, 2018.
- **J. Rosenthal**, G. Benabdallah. "IBPoet: An Interactive & Biosensitive Poetry Composition Device," in *Proceedings of the ACM UbiComp Conference*, 2017.
- J. Pei, L. Murchison, A. Ben Shabat, V. Stewart, **J. Rosenthal**, et al. "Ground Demonstration on the Autonomous Docking of Two 3U Cubesats using a Novel Permanent-Magnet Docking Mechanism." *AIAA Aerospace Sciences Meeting*, 2017.

Posters

- A. Sharma, E. Kampianakis, **J. Rosenthal**, G. Moore, M.S. Reynolds, and J. Smith, "Fully Wireless Instrumentation for a Bi-Direction BCI," *NeuroFutures Conference*, 2018. (Poster)
- **J. Rosenthal**, A. Murch, D. Gebre-Egziabher. "Aerodynamic Characterization of the Mini Ultra Stick Airframe." *National Conference for Undergraduate Research*, Poster Presentation, 2012.

Honors and Awards

- National Science Foundation Graduate Research Fellowship (GRFP), 2018
- NASA Space Technology Research Fellowship (declined for the NSF GRFP), 2018
- NASA Group Achievement Award for RaD-X, 2016
- NASA Group Achievement Award for the Autonomy Incubator, 2017
- Roger M. Nordby Engineering Scholarship, 2011
- New Look Laser Technologies Essay Scholarship Winner, 2009
- Academy of Model Aeronautics Student Achievement Scholarship, 2008
- University of Minnesota *Gopher Gold* Scholarship, 2008-2012

Hardware & Software Experience

- Coding: Embedded C, Verilog, Python, Matlab
- Design Software: Altium Designer, Eagle CAD
- Applications: Windows Office Suite, LaTeX
- Operating Systems: Windows, Linux
- Protocols: Bluetooth Low Energy, UART, SPI, I2C, CAN, USB, 1-Wire
- Lab Experience: Circuit prototyping and debugging, Network Analyzers, Spectrum Analyzers, Oscilloscopes, Multimeters, Soldering (through-hole, surface-mount)
- Testing Experience: Thermal Vacuum Chamber, Burn-in, Radiation Beam Calibration, IACUC-approved Animal Testing

Volunteering & Outreach

- UW *Summer Youth Electronics Design* Instructor, 2018
- UW *GEARUP* Outreach Presenter, 2018
- UW *Engineering Days* Outreach Presenter, 2017-Present
- UW *Graduate and Professional Student Senate* Senator, 2018-Present
- UW *EE Graduate Student Association* President, 2016-2018
- UW *EE Soldering Workshop* Instructor, 2017
- *Educurious* Student Mentor, 2018-Present
- *Washington State Opportunities Scholar Program* Mentor, 2016-2018
- *Big Brothers Big Sisters* Mentor, 2016
- NASA *HUNCH* Outreach Mentor, providing hands-on experience to students building space-flight hardware, 2013-2016
- NASA *Virtual Career Fair* Speaker, 2015
- NASA RaD-X Outreach Presenter at Fort Sumner High School in New Mexico, 2015
- NASA *Speaker's Bureau* Volunteer Speaker at local schools and libraries, 2013-2016
- STEM tutor for high school and undergrad students, 2013-2016
- Speaker at the College of William & Mary's annual *Focus on the Future* event, 2014-2016
- *International Rescue Committee* Refugee Resettlement Volunteer, 2013
- University of Minnesota Engineering Student Ambassador, 2011

Outside Interests

- Languages: French (negotiation level)
- Full-size glider pilot (FAA PPG Certificate)
- Ham radio (KK4VMN)