Jonathan**Mash**

contact

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education

Queen's University
2009 – 2013
M.Sc. in Electrical Eng.
Queen's Centre for Energy and Power Electronics Research
Thesis: Advanced Nonlinear Control Techniques for Wind Energy Conversions Systems
Course Avg: 92%

2004 – 2009
B.Sc. in Electrical Eng.
2nd/45 in Elec. Eng.
5th/576 in all Eng.
Final Year Avg: 93%

design tools

★Altium, Mentor Xpedition, Matlab, PSIM, SIWave, Visual Studio, ★Git/GitHub

programming

★Python, ★C/C++, Javascript, HTML5, CSS3, MySQL, Linux.

interests

Family, ★3D Printing, ★Woodworking, Electronics, Multirotor Drones, Solar Power Systems, Microcontrollers.

awards

2010 – *Ontario Graduate Scholarship*

2009 – *NSERC - Alexander Graham Bell Canada Graduate Scholarships*

skills

core: leadership, team & project management, problem solving, effective communication.
electronics: product development, system design, requirements, hardware/firmware interfaces.
hardware: pcb design, simulation, assembly & rework, testing & debugging, DfX.
firmware: specifications, design, programming, testing & debugging, deployment.

experience

2020 – Present

Amazon Project Kuiper Seattle, WA, USA
Hardware Development Manager - Avionics and Endpoints
- Recruited, trained, and managed a cross-functional team of over 14 electrical, system, and SI/PI engineers. Completed over 270 interviews at Amazon.
- Team lead and manager of the satellite Avionics & Bus Endpoints Team. Owner of flight computer, vehicle-wide communication bus, magnetometer, sun sensor, magnetorquers, propulsion control unit, solar array deployment unit, cameras, and more. Contributed to power distribution, ground communication systems, star tracker, phased array antennas and reaction wheels.
- Responsible for all aspects of the hardware design. Architecture, requirements, development, testing, and qualification of hardware. Liaison between the Design Engineering team and the Systems, Reliability, Hardware Test, and Manufacturing Engineering teams.
- Maintained consistent and clear communication up the management chain. Maintained and drove closure on schedule and schedule mitigation. Owner of multi-million dollar development budget.

2016 – 2020

Amazon Prime Air Seattle, WA, USA
Hardware Development Manager - Aircraft Electronics
- Recruited, trained, and managed a cross-functional team of electrical, mechanical, system, and support engineers.
- Managed org-wide electrical engineering support resources, including component librarian services, Altium ECAD administration, design standards documentation, and quality & reliability processes/workflows.
- Oversaw the requirements derivation, development, testing, and qualification of key Avionics subsystems. Liaison between the Design Engineering team and the Systems, Reliability, Hardware Test, and Manufacturing Engineering teams.

Sr. Hardware Development Engineer
- Owner/designer of several vehicle subsystems such as vehicle power distribution, multiple sensor systems, and ground station equipment.
- Supported the integration of Avionics subsystems into the vehicle. Developed installation checklists and provided on-call support to flight ops.
- Liaison between engineering teams to ensure that hardware designs maximize the efficiency of firmware development. Examples include boundary scan, standardized debug interface & indicators, and consistent pinout.
- Managed an external vendor relationship to develop a custom product to reduce the size, weight, and power consumption of the power regulation subsystem.

Hardware Development Engineer
- Oversaw the entire hardware process from design through to manufacturing: Component selection, PCB design, prototypes, and testing.
- Developed manufacturing, assembly, and testing procedures to ensure that high quality products are delivered to the vehicle program.
- Produced a standardized set of design artifacts for use across vehicle subsystems, ensuring consistent quality and reliability for Avionics hardware.
- Firmware development for a RF radio link to the ground. Developed a BSP package and drivers for the common vehicle microcontroller. Planning and development of unit, regression, and integration tests.

other experience

2010	**SPARQ Systems**	Kingston, Ontario, Canada

⌄ *Lead Product Developer*

2016
- Recruited and trained new employees to grow the group from just myself to a team of six highly talented developers and engineers.
- Actively involved in high-level market research, feature requirements derivation, and product requirements specifications.
- Developed an in-house embedded Linux device utilizing advanced Zigbee communication, USB, 802.11 WiFi, and a WebSocket API to connect to cloud servers.
- Built an AWS-based monitoring and control product using web technologies.
- Oversaw the entire hardware process from design through to manufacturing, including component selection, PCB design, mechanical design, prototyping, and testing. Developed manufacturing, assembly, and testing procedures to ensure that high quality products are delivered to customers.
- Led and supported the deployment of field trials at sites across North America.
- Coordinated multiple teams and external contractors working on key projects.
- Developed a novel Power Line Communication protocol using Forward Error Correcting codes for robust communication with solar microinverters.

2009	**Centre for Energy and Power Electronics Research**	Kingston, Ontario, Canada

⌄ *Engineering Research Assistant*

2013
- Researched and designed a medium-power front-end converter for telecommunications equipment using simulation tools.
- Developed a wind turbine emulator using an induction motor connected to a permanent magnet synchronous generator for use in research activities.
- Derived novel non-linear control schemes for a PMSG-connected wind turbine.

2008	**Ontario Power Generation**	Pickering, Ontario, Canada

Student - Computers and Controls Division
- Developed and deployed an online portal to aid in knowledge retention.
- Identified project requirements, researched possible solutions, and implemented the chosen solution: Microsoft's Sharepoint with custom workflows.

2004	**Queen's University Solar Vehicle Team**	Kingston, Ontario, Canada

⌄ *Project Manager*

2008 Competitions: *World Solar Challenge Australia* & *North American Solar Challenge*
- Oversaw all aspects of a semi-professional racing team.
- Supervised the design, fabrication and testing of the vehicle.
- Directed efforts in marketing, sponsorship, event planning, and PR.
- Managed all financial planning, purchasing, cash flow, and budgeting.
- Led fund-raising efforts, raising over $500,000 in cash and in-kind donations.
- Knowledge of all vehicle design including electrical, mechanical, and software.
- Was the team's expert on power systems, lithium-based batteries, and solar cells.

patents & publications

2019	**Patent: Intelligent electrical system for vehicle**	Jonathan Mash, Amazon Technologies Inc.

USPO: US11094146B1

2014	**Adaptive Passivity-Based Nonlinear Controller for Wind Energy Conversion Systems**	Jonathan Mash, Majid Pahlevaninezhad, Praveen Jain

Full paper presented at a major IEEE Conference (APEC 2014, Ft. Worth, TX)

2014	**Port-Controlled Hamiltonian (PCH)-based control approach for wind energy conversion systems**	Majid Pahlevaninezhad, Shangzhi Pan, Jonathan Mash, Praveen Jain

Full paper presented at a major IEEE Conference (PEDG 2014, Galway, Ireland)

2013	**Nonlinear Control of Wind Energy Conversion System Based on Control-Lyapunov Functions**	Jonathan Mash, Majid Pahlevaninezhad, Praveen Jain

Full paper presented at a major IEEE Conference (ECCE 2013, Denver, CO)