JonathanMash

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 Eng.
Final Year Avg: 93%

design tools

⋆Altium, Matlab, PSIM, SIWave, Visual Studio, ⋆Git/GitHub

programming

⋆Python, ⋆C/C++, C#, Javascript, HTML5, CSS3, TCP/IP, HTTP, Zigbee, MySQL, CouchDB, RTOS, Linux, ⋆BSP

interests

Electronics, Robotics, ⋆Multirotor Drones, Solar Power Systems, ⋆Microcontrollers, ⋆Embedded Systems, Linux, 3D Printing, Woodworking.

skills

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

experience

2016 – present

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. Completed over 60 interviews.
- 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 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 and 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.

2010 – 2016

SPARQ Systems — Kingston, Ontario, Canada

Lead Product Developer

- 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 solution 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.

other experience

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.

2007 **Faculty of Applied Science** Kingston, Ontario, Canada
Senior Teaching Assistant
2011 **Project Manager** - Managed and taught six teams of four students the process of design, implementation, and prototyping in a team environment.
Lab Manager - Facilitated hardware and software labs in four undergraduate ECE courses. Assisted in the development and execution of a new robotics project-based course for second year ECE students.

patents & publications

2019 **Intelligent electrical system for vehicle** **Jonathan Mash**, Amazon Technologies Inc.
USPO: US10366549B2

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)

awards

2010 **Ontario Graduate Scholarship**
A merit-based research grant awarded by the Province of Ontario. Selection based on academic achievement and research potential.

2009 **NSERC - Alexander Graham Bell Canada Graduate Scholarships**
A merit-based research grant awarded by the Government of Canada. Selection based on academic achievement and research potential.