

# Jonathan Mash

## contact

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Canada

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## programming

★ NodeJS  
Javascript, HTML5,  
CSS3, C/C++, C#,  
★ Git

## interests

electronics, robotics,  
drones,  
solar/alternative  
energies

## skills

project management, product development, product design. electronics design, embedded systems, prototyping, manufacturing.

## experience

- 2010–Now **SPARQ Systems** Kingston, Ontario, Canada  
*Product Development Lead*
- Designed, prototyped, and manufactured a compact in-home device for solar panel monitoring. Involved in the design decisions of the associated web portal.
  - Developed novel communication protocol over Power Line Communication using FEC coding for robust monitoring and control of the microinverters.
  - Developed the manufacturing, assembly, and testing procedures to ensure only high quality products are delivered to our customers.
  - Trusted by senior management to provide independent engineering support to customers due to in-depth knowledge of the entire system.
- 2009–2013 **Centre for Energy and Power Electronics Research** Kingston, Ontario, Canada  
*Engineering Research Assistant*
- 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.
  - Developed novel non-linear control strategies for PMSG connected wind turbine systems.
- 2004–2008 **Queen's University Solar Vehicle Tam** Kingston, Ontario Canada  
*Project Manager*
- Competed at two international competitions:
- Panasonic World Solar Challenge, Australia (October 2007)
  - North American Solar Challenge, USA and Canada (July 2005)
- Responsibilities:
- 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 financial planning, purchasing, cash flow, and budgeting.
- Skills and Innovative Approaches:
- Reorganized the team structure to increase efficiency and improve communication flow.
  - Led fundraising efforts, raising over \$500,000 worth of cash and donations.
  - Knowledge of all vehicle design incl.: electrical, mechanical, and software.
  - Designed and constructed a solar array producing over 1200 Watts.
  - Team's expert on power systems, lithium-based batteries, and solar cells.

## education

- 2009–2013 **M.Sc.** in Electrical Engineering Queen's University @ Kingston  
Queen's Centre for Energy and Power Electronics Research  
Supervisor: Dr. Praveen Jain  
Course Average: 92%
- 2004–2009 **B.Sc.** in Electrical Engineering Queen's University @ Kingston  
Ranked 2<sup>nd</sup> of 45 students in Electrical Engineering.  
Ranked 5<sup>th</sup> of 576 students in all of Engineering.  
Final Year Average: 93%

## 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.
- 2009      **IEEE Eastern Ontario Student Paper Competition**  
Represented Queen's University at a team-based project competition between universities across eastern Ontario. Selection was weighted heavily toward presentation skills and quality of work.

## publications

- 2013      **Nonlinear Control of Wind Energy Conversion System Based on Control-Lyapunov Functions** Jonathan Mash, Majid Pahlevaninezhad, Praveen Jain  
Presented at a major IEEE Conference (ECCE 2013, Denver, CO)
- 2013      **Advanced Nonlinear Control Techniques for Wind Energy Conversions Systems** Jonathan Mash  
Thesis — Master, Electrical & Computer Engineering (Mar. 2013)
- 2014      **Adaptive Passivity-Based Nonlinear Controller for Wind Energy Conversion Systems** Jonathan Mash, Majid Pahlevaninezhad, Praveen Jain  
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  
Presented at a major IEEE Conference (PEDG 2014, Galway, Ireland)

## affiliations

Professional Engineers Ontario (PEO), Ontario Society of Professional Engineers (OSPE), Institute of Electrical and Electronics Engineers (IEEE)