

# ADAM ING

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## Proficiencies

- Math software: Matlab/Simulink, Maple/MapleSim, Optimus
- Programming Languages: Python, C/C++, VB.NET, HTML, PHP
- Engineering Software: Arduino, COMSOL, Solidworks, Labview, CES Material Selection
- Other software: LaTeX, Google SketchUp, ProAnalysit Motion Capture
- Languages: English, 2 years at Renmin University studying Chinese (Mandarin) in Beijing, China
- Want to learn: hardware/software integration, rapid prototyping, data analysis, hardware controls

## Professional Experience

Simulations and Prototyping Engineer, Magna E-Car Systems May 2010 – Sept. 2011

- Sized, sourced, procured and tested custom manifold for liquid-cooled battery thermal management system used in electric vehicle conversion
- Created model of liquid-cooled battery pack to support controls development in MATLAB
- Mentored by racecar body specialist to create superlight composite battery case & modules composed of: carbon fibre (dry and epoxy-impregnated), glass fibre, aramid fibre

Battery Test Engineer, Magna E-Car Systems May 2011 – Sept. 2011

- Developed small scale lithium-polymer battery fabrication process for testing new cell chemistries and materials, including: electrode material mixing; coating; pressing and punching; cell stacking; tab welding; and battery cycling. Documented process and trained shift workers.
- Wrote scripts to test charge-discharge properties of prototype battery cells
- Designed mechanical fixtures to assist in cell assembly using SOLIDWORKS

## Education

M.A.Sc., Systems Design Engineering, University of Waterloo Sept. 2012- Aug. 2014

- Program focus: optimization, simulation, control, dynamics, hybrid electric vehicles
- Thesis: programmed an algorithm to automate the exploration and optimization of hybrid electric vehicle architectures using MATLAB and Maple
- Additional projects: (i) parameter estimation of lithium-ion battery model, (ii) parameter estimation of a two-motor, five-bar mechanism

B.A.Sc., Materials Science and Engineering, University of Toronto Sept. 2007- May. 2012

- Program focus: (i) manufacturing, and (ii) sustainable development (energy management)
- Thesis: fabricated a nanocomposite thin-film that breaks down volatile organic compounds (ie: unburned hydrocarbons in automobile emissions) when exposed to UV radiation
- Team Lead for design projects: Zero Emissions Medical Shelter, Steel Foundry

## Publications / Presentations

- Comparison of Optimization Techniques for Lithium-ion Battery Model Parameter Estimation (technical paper & presentation, SAE2014 Congress)
- Automated Synthesis and Optimization of Hybrid Vehicle Topologies (presentation, ISSS conference, 2013)
- Zero Emissions Medical Shelter (product presentation, ISSS conference, 2012)
- Public Acceptance of Electric Vehicles in Toronto (paper and presentation, ISSS conference 2011)

## Leadership Roles

- Vice President, Systems Design Engineering Graduate Student Association, U. Waterloo (2012-2014)
- Chair, Materials Science and Engineering Industry Club, U. Toronto (2011-2012)
- Chair, International Society for the System Sciences, Special Integration Group for Students (2009-2011)