

# Michael Elliot King – Curriculum Vitæ

DEPARTMENT OF MECHANICAL ENGINEERING  
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Born: February 14, 1991 – Quincy, MA  
Nationality: American

## Summary

I am a recent graduate of McGill University passionate about engineering design, specifically robotics and human computer interaction. I am currently looking for full time employment starting in September 2014, following my design team commitments.

## Education

2009 - 2014 **B.Eng., Mechanical Engineering**  
*McGill University* – Montreal, Quebec

## Relevant Experience

- 8/2013 - 8/2014 **CO-FOUNDER & MECHANICAL ENGINEERING LEAD**  
*McGill Robotics – A.U.V. Design Team* – Montreal, Quebec  
3rd place static, 10th place overall – AUVSI International RoboSub Competition in San Diego  
Judges Award – Best Branding and Business Development (\$500)
- Created and implemented a comprehensive structure, brand, environment, and management system from scratch for a student organization with 98 members
  - Lead all mechanical design, manufacturing and testing for the team of 60 creating an autonomous underwater vehicle
  - Delegated work to and solved problems with 16 members of the mechanical division
  - Designed the vehicle assembly with Inventor for FEA, dynamic modeling, 3D printing, machine drawings and simulations
- 9/2013 - 7/2014 **DEVELOPMENT OF A VARIABLE-FRICTION SHOE-SURFACE MECHANISM**  
*Interdisciplinary Design Project* – Montreal, Quebec  
Independent 7-month design & manufacturing project  
Supervised by Professor Jeremy Cooperstock, *McGill Centre for Intelligent Machines*
- Created from scratch a mechanism to fit in the sole of a shoe and dynamically simulate the friction of a full range of surfaces
  - Designed the mechanical, electrical and software systems using Autodesk Inventor and Arduino
  - Manufactured complete functioning prototype of mechanism to 0.05mm tolerances using conventional milling & turning, CNCing, and welding
  - Implemented a PD controller to actuate two compact braking pads using a stepper motor, gear system, and lead screws
  - Verified full functionality through a series of static and kinetic friction tests

- 9/2013 - 5/2014    **DEVELOPMENT OF THE PROPULSION & CONTROL SYSTEM FOR AN A.U.V.**  
*Mechanical Engineering Senior Capstone Project* – Montreal, Quebec  
 Collaborative 7-month design & implementation project  
 Client: McGill Robotics | Supervisor: Professor Meyer Nahon
- Designed a 5-DOF propulsion & control system using C++ and ROS
  - Arranged 6 thrusters around the COG for surge, sway, heave, pitch, and yaw control
  - Simulated the controls with dummy sensor data in a 3D environment within Gazebo
  - Implemented the system by interfacing with the autonomous planner, computer vision and motor control
  - Created test platforms and wet-tested the full system in a pool, for both tethered and autonomous missions
- Summer 2013    **CONTROL SYSTEMS & ENGINEERING INTERNSHIP**  
*T. Davlin Glass* – Cambridge, Massachusetts  
 Designer gold-leaf glass tiles and glass products
- Designed, manufactured, and wired systems to control the temperature of custom-built, high-powered glass kilns
  - Aided in the design and construction of additional kilns
- 8/2012 - 8/2013    **MATERIAL COLLECTION SYSTEM LEADER | MARKETING & MEDIA DIRECTOR**  
*McGill LunarEx Robotics Design Team* – Montreal, Quebec  
 12th place out of 50 international teams at NASA's Lunabotics Mining Competition – Orlando, Florida  
 Supervised by Professor Peter Henry Radziszewski
- Member of a team of 40 students creating an autonomous mining lunar robot
  - Lead the efforts of a five person group responsible for designing, constructing and assembling the mechanism that collects and dumps lunar regolith simulant
  - Brought original concepts to realization through sketching, CADing, machining, assembly, and testing
  - Machined & CNCed aluminum, molded composites, 3D printed new materials, and fabricated sheet metal parts
  - Developed rebranding strategies to increase interest and team credibility
  - Enhanced project marketing and sponsorship visibility through media exposure
  - Documented each step of the design process, meetings, outreach, and competition with my photography
  - Shot, directed and edited a promotional film that was sent to all sponsors and shared on social media outlets

Summer 2012 &  
Summer 2013

## ENGINEERING INTERNSHIP

*Robies Heating & Cooling HVAC* – Hyannis, Massachusetts

- Developed and implemented automated programs for generating project estimates
- Calculated thermal loads
- Developed a work flow and integrated inventory management system
- Recorded and analyzed inside climate data
- Provided company-wide technical support
- Prepared reports for clients and staff
- Analyzed sales trends and provided detailed reports

1/2013 - 8/2013

## FRONT END & USABILITY LEAD

*Braille University iPhone Application* – Montreal, Quebec

Tool to aid in teaching Braille to blind children using an electronic medium

Supervised by Professor Jeremy Cooperstock, *McGill Center for Intelligent Machines*

- Created a mobile application focusing on usability and the user interface
- Using a user-centered design approach, created prototypes, conducted user-tests, and coded the application to be easy to use, even without the use of vision
- Collaborated with Braille education professionals to create an authentic curriculum and legitimate learning tool (Anne Jarry, Nathalie Martiniello: *Université de Montréal*)

## Software & Programming Skills

Computer Aided Design: *Inventor, Solidworks, AutoCAD*

Data Analysis: *MATLAB, Excel*

Programming Languages: *Python, C, C++, Objective-C, ROS*

Version Control Systems: *Git, Autodesk 360*

Web Development: *HTML5, CSS, Markdown, Jekyll, Google Analytics, SEO*

Digital Typesetting: *L<sup>A</sup>T<sub>E</sub>X, X<sub>Y</sub>L<sup>A</sup>T<sub>E</sub>X*

Media & Graphics: *Illustrator, Lightroom, Photoshop, InDesign, Final Cut Pro*

## Activities & Interests

2010 - Present

Photography - [www.michaellelliottphotography.com](http://www.michaellelliottphotography.com)

2009 - 2014

McGill University Intramural Ultimate Frisbee (1st Place 2010, 2011)

2012 - 2013

Photo Contributor - [The McGill Tribune](#)

2011 - 2012

McGill Engineering Undergraduate Society Website Committee

2010 - 2011

McGill University International Student BUDDY Mentor Program