Daniel Johnson

M.A.Sc., B.A.Sc.
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Goal: To work with a team solving interesting problems in mechatronics and robotics. My fourth year design project was to develop 3-D 6 degree of freedom SLAM algorithm for the NASA Sample Return Challenge and I'd be excited to return to that area of work at Clearpath.

Skills

- **Modeling:** 2-D and 3-D Dynamics and simulation of multibody systems.
- **Control Systems:** Practical experience with optimal control of biomechanical models using Pontryagin's Minimum Principle. Theoretical training in multi-variate, adaptive, and optimal control and state estimation techniques
- **Development:** C/C++, Python, MATLAB, Git, Objective-C, ROS, Linux
- **Experimentation:** Designed and executed experiments involving human subjects and processed the resulting data to estimate parameters for system modelling and control
- **Autonomous Systems:** Designed and developed a 3D 6DoF SLAM algorithm for the NASA Sample Return Challenge using ROS, Gazebo, Python, and C++.
- **Communication:** Excels at writing clear and concise documents and explaining ideas
- **Learning:** Love to learn new things and explore new ideas. Quick to pick up new skills and technologies as required

Education

University of Waterloo Waterloo, ON
Masters of Applied Science - Systems Design Engineering *2012-2015*

- Created a comprehensive, 3-D, forward dynamic, golfer swing model using MapleSim and Matlab on Linux. The model is optimally controlled to allow for evaluation of golf club designs.
- Delivered the completed model to an industry partner along with complete documentation.
- Excelled in courses in multivariate, adaptive, and optimal control systems.
- Managed Linux server for the lab including web sites, file shares, and wiki pages.

University of Waterloo Waterloo, ON
B.A.Sc. - Systems Design Engineering, Dean's Honour List, Co-operative Program *2007 - 2012*

- *4th Year Design Project* - SLAM for NASA Sample Return Challenge
  - Combined Kalman Filters, Iterative Closest Point (ICP), and GraphSLAM algorithms to develop a novel approach for 6 degree of freedom simultaneous location and mapping without the use of GPS
  - Improved on the performance of these methods individually by performing GraphSLAM in the background and updating the pose information after its completion.

Work Experience

University of Waterloo (Vision and Image Processing Lab) Waterloo, ON
Research Assistant - `vip.uwaterloo.ca/website-package` *May-Aug 2011*

- Developed algorithms for processing SAR imagery of sea-ice in the Canadian North
- Implemented algorithms within existing image processing software in Visual C++.
- Supervised and assisted a co-op student building a website for the lab using Drupal resulting in a package for building research group websites that was released as open-source
- Administered linux web server for hosting the lab website

Apple Inc. Cupertino, CA
Software Engineering Intern - iOS Location Software *Jan-Apr 2010 and Sep-Dec 2010*

- Designed and implemented a testing framework for location algorithms on iPhones and iPads in the form of an iOS application, Mac application, and accompanying server-side code. This application was used by the iOS Location team to develop and test indoor positioning systems.
- Developed an improved location algorithm using Kalman Filters for determining an iOS device's location during indoor positioning.

Trimble Navigation Christchurch, NZ
GPS Software Tester *May-Aug 2009*

- Developed and performed experiments on software keyboards for mobile devices using C#.
- Developed embedded micro-controller code for RF chamber test rig for handheld GPS devices.
- Tested hand held GPS devices for accuracy and interface usability.

CREZ Basketball Waterloo, ON
Software developer *Jan-Apr 2007 and Sep-Dec 2007*

- Developed statistics software for basketball coaches in Visual Basic .NET and C#
- Implemented client-side code for livestreaming basketball statistics to a web service.
- Packaged and released software to clients using InstallShield.
- Provided technical support through direct interaction with customers and written documentation

Personal Projects

Bearded Baritones Website nodeJS, Javascript, HTML & CSS
`github.com/proverbialsunrise/baritonesWebsite` *2015*

pySTL Python
`github.com/proverbialsunrise/pySTL` *2014*

Hymnal Mobile Application Objective-C, C++, Java
`github.com/proverbialsunrise/hymnalapp` *2010*

Personal

Crash Ultimate - KW Guelph Competitive Ultimate `crashultimate.ca`
Captain *2013-*

- Elected captain of National Championship winning team in 2014

Hobbies: Singing (A Cappella and Barbershop in particular), Ultimate Frisbee, Soccer, Basketball