

# Ryan W. Alexander

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## PROFESSIONAL EXPERIENCE

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### ***Suspension and Structures Engineering, Multimatic***

Markham, ON 08/2015 – 07/2018

- Developed concept-to-production suspension systems and components for automotive OEMs
- Determined testing process and analyzed test results in MATLAB to ensure product meets specifications
- Instrumented, tested, and improved design of the award-winning Chevrolet Colorado ZR2 DSSV Shocks
- Collaborated with simulation team on MATLAB and ADAMS models to ensure product reliability
- Invented a patented ball joint design and manufacturing technique, generating intellectual property

### ***Chassis Design Engineer, Fiat Chrysler Automobiles***

Auburn Hills, MI 12/2011 – 12/2012

- Responsible for the design of suspension components for over 500,000 vehicles per year
- Improved mass-specific stiffness of the next generation suspension system design while meeting performance objectives to improve vehicle cost, ride quality, and fuel economy
- Led an advanced R&D project from base concept through prototyping, integration, and wind tunnel testing of a new proprietary technology, enabling a 3% reduction in highway fuel consumption
- Solved a damper noise issue through instrumented testing, increasing customer satisfaction

### ***Race Engineering & Data Analysis, AIM Autosport***

Toronto, ON 3/2011 – 12/2011

- Adjusted suspension, tire, and aerodynamic configurations to improve race car performance
- Maintained reliable function of vehicle data acquisition, video, and radio electronics
- Achieved expert class-winning results with AIM Autosport's Pro Mazda team for 5 of 7 entered races
- Coached drivers with video, data, and graphical aides to reduce lap times and increase consistency
- Catalogued effects of vehicle setup changes to ensure tuning efficiency and consistency

### ***Design Engineering Intern, General Dynamics***

London, ON 5/2008 – 8/2009

- Isolated a gearbox issue using 6-Sigma tools on field reliability data to avoid a fleet-wide recall
- Coordinated FMVSS qualification of a new braking system to maintain product release timing
- Matched engine, torque converter, and transmission options to improve vehicle performance
- Analyzed effects of vehicle wheelbase on vehicle performance metrics to improve passenger comfort
- Processed characterization data using Glyphworks to validate vehicle performance and durability

### ***Test Engineering Intern, Peiker Acoustic***

Friedrichsdorf, Germany 4/2006 – 9/2006, 4/2007 – 9/2007

- Developed and executed test plans for automotive electronic products and prototypes, incorporating Automated Fault Insertion methodologies, to reduce product defects
- Selected and populated FMEA management software to improve product quality

## EDUCATION

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### **The University of Western Ontario**

London, ON 2015

- Master of Engineering Science, Mechanical and Materials Engineering.
- Relevant work: Applied Measurement and Sensing, Composite Material Design and Processing, Aerodynamics, Computational Fluid Dynamics, Material Science

### **The University of Western Ontario**

London, ON 2010

- Bachelor of Engineering Science, Mechanical Engineering.
- Relevant work: Mechatronics, Formula SAE, Programming, Finite Element Methods, Mechanical Vibrations, Thermodynamics, Heat Transfer, Production Management, Human Biomechanics

## ACADEMIC ENGINEERING EXPERIENCE

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### ***Advisor - Vehicle Dynamics, Systems Integration, Aerodynamics, University of Western Ontario***

#### **Formula Society of Automotive Engineers (Western Formula Racing)**

2013 - 2015

- Collaborated on the design, analysis, and manufacturing of the chassis, suspension, and aerodynamics systems including vehicle dynamics lap simulation, tire analysis, vehicle setup, and calibration
- Coordinated with electrical engineering team to implement a closed-loop electromechanical shifting system with CAN interface, reducing driver cognitive load and improving reliability
- Coached and motivated team members to increase the output of the team and develop individually, correlating with the best finish from an Ontario university at 3 international competitions in 2014
- Created the team's first 3D printed steering wheel to improve driver ergonomics, timing, and cost

### ***Technical Director and Head of Vehicle Dynamics & Suspension, Western Formula Racing***

2008 - 2010

- Led and managed a cross-functional team of 40 engineering and business students responsible for design, integration, manufacturing, testing, and competition of a formula-style race car
- Presented the vehicle, team, and suspension designs to industry expert judges to set a team record for highest design score in an international competition
- Finished in the top 5 of 78 international universities at the FSAE California competition, a team record
- Improved placement at Formula SAE Michigan by 50 places to 20<sup>th</sup> place over 2 years by focusing team efforts on effective collaboration, vehicle performance, mass-efficiency, and manufacturability
- Quickly learned suspension and vehicle dynamics theory then applied it with two ground-up chassis and suspension iterations, resulting in the lightest and most agile race car the team has built to date
- Guided brake and hub system designers to develop a floating brake rotor system to improve braking performance, reduce pad wear, and reduce rolling friction
- Increased manufacturing efficiency, reducing frame manufacturing time from 2 months to 2 weeks
- Administered design reviews with industry sponsors and alumni, improving quality and timing

### ***Head of Powertrain Team, Western Formula Racing***

2007 - 2008

- Calibrated engine fuel, ignition, and idle control on a water brake dynamometer, resulting in a 7% increase in usable engine power and reduced fuel consumption
- Developed MATLAB-based acceleration simulation to streamline powertrain bench testing process
- Managed a team of 4 students to develop a reliable and efficient engine package while coordinating with other project managers to ensure seamless integration with other vehicle systems
- Used Ricardo WAVE to simulate the effects of exhaust and intake setups, improving engine performance

### ***Powertrain Team Member, Western Formula Racing***

2006 - 2007

- Developed and implemented open-loop electronic pneumatic gear shifting system which significantly improved driveability and reduced shift times by 73% to 80ms
- Gained hands-on experience with machine shop fabrication tools and trained new members

## SKILLS & ADDITIONAL QUALIFICATIONS

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**Engineering software:** MATLAB, Simulink, LabVIEW, UG NX, SolidWorks, CATIA V5, STAR-CCM+

**Also skilled in:** Excel, C++, Python

**Fabrication skills:** Fixtures, CNC milling, TIG and MIG welding, composite wet lamination and infusion

**Languages:** English (fluent), German (conversational), French (basic)

Introduction to Self-Driving Cars by University of Toronto on Coursera. Formula SAE design judge and technical inspector. Electric vehicle enthusiast (converted a Mazda Miata to full electric). Acoustic guitar. OptimumG Vehicle Dynamics Course. Work examples on [RyanWAlexander.com](http://RyanWAlexander.com).