

Ryan W. Alexander

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PROFESSIONAL EXPERIENCE

Suspension and Structures Engineering, Multimatic

Markham, ON 08/2015 – 07/2018

- Developed concept-to-production suspension systems and components for automotive OEMs
- Created test cases 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
- Managed a mechatronic R&D project from concept through benchmarking, integration, and wind tunnel testing of a new proprietary technology, enabling a 3% reduction in highway emissions
- Developed test plans and conducted vehicle-level tests to verify performance of vehicle improvements
- Diagnosed a damper issue with instrumented testing and used DFMEA to manage the risk of possible design solutions, leading to a robust solution that increased 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 CAN-based 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
- Catalogued effects of vehicle setup changes to ensure tuning efficiency and build knowledge base

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
- Used a MATLAB Simulink model to match transmission, engine, and torque converter options
- 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 software test plans for automotive electronic products and prototypes, incorporating HIL-based automated fault insertion methodologies, to reduce product defects
- Implemented FMEA management software to manage and prioritize risks in product design

EDUCATION

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

ACADEMIC ENGINEERING EXPERIENCE

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 simulations, tire analysis, vehicle setup, and calibration
- 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
- Supported the successful implementation of a closed-loop electromechanical shifting system with CAN interface and real-time embedded controller, reducing driver cognitive load to improve lap times
- 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

- Managed a cross-functional team of 40 engineering and business students and responsible for the design, integration, manufacturing, testing, and competition of a formula-style race car
- 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
- 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 result at Formula SAE Michigan by 50 places to 20th place over 2 years by focusing team efforts on effective collaboration, vehicle performance, mass-efficiency, and manufacturability
- 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

- Programmed engine fuel, ignition, and idle control of a real-time embedded engine controller 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 mechatronic 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

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

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

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

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

07/2018 - Present: Automotive Engineering Consulting, International Travel, and University of Toronto's Introduction to Self-Driving Cars. Formula SAE Vehicle Dynamics design judge. Converted a Mazda Miata to electric. OptimumG Vehicle Dynamics Course. Work examples on RyanWAlexander.com.