Graham Davison

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BASc, Mechanical Engineering, Welding and Joining Specialization

I enjoy fast-paced problem-solving and am eager to participate in the design and development of technical projects. I believe my previous product design experience and fabrication and troubleshooting skills make me a valuable member of any engineering team.

Highlights of Qualifications

- Over 5 years of product design and management experience with electro-mechanical automation devices (linear stages and rotary tables)
- Strong and methodical, mechanical, and technical skills developed through successful completion of many complex technical projects
- 10 years experience completing projects with primarily SolidWorks, AutoCAD and Autodesk Inventor
- 5 years experience with GD&T while completing drawing packages, designing components and working with vendors and suppliers
- Exposure to ASME Y14.5, CSA W59 and CSA W47.1/2 standards
- Experience with 5S/Lean manufacturing workplace organization
- Excellent communication skills attained in technical and non-technical fields
- Highly motivated with a strong work ethic and ability to quickly learn new skills
- Maintains punctuality and adheres to deadlines

Work Experience

Mechanical Design Engineer, Zaber Technologies, Vancouver, BC
July 2018 – November 2023

- Completely redesigned two high volume linear motion product lines to improve various performance specifications and reduce overall cost
- Improved internal manufacturing processes for induction heat-treatment, surface finishing and bearing rail manufacturing processes through iterative experimentation and testing
- Designed and fabricated custom prototypes, proof of concepts, assembly fixtures and test jigs
- Conducted extensive device testing on prototypes and initial production linear and rotary stages
- Ensured compliance with CE machinery directive and electromagnetic compatibility directive (EMC) of new designs
- Exposure to ISO 13732-1 human response to contact with hot surfaces, ISO 12100 general principles for design, ISO 13854 - risk assessment and reduction and minimum gaps
- Managed products through entirety of lifecycle; from planning phase to design, product launch and product support
- Supported designs with thorough and iterative FMEA to improve user safety and device reliability

Mechanical Designer, TRIUMF, Vancouver, BC
May 2017 – August 2017 (Co-op)

- Designed test stations and large steel weldments to aid in the repair of beamline equipment
- Evaluated structural integrity of test frames using ANSYS Workbench
- Assisted the Remote Handling Group by designing new tooling and fixtures
- Conducted preliminary testing on new remotely operable water fittings

CNC Engineering Technician, voestalpine Rotec Summo Corp, Burlington, ON
September 2016 – December 2016 (Co-op)

- Designed and fabricated work holding fixtures for CNC milled components
- Programmed and operated CNC milling machine using HSMWorks CAM package
- Assisted the Research and Development department by producing custom parts

Skills

Fabrication Skills

Welding (GTAW, GMAW)
Milling & Turning
Sheet Metal Fabrication
Plasma Cutting
Assembly
Painting &Finishing
3D Printing
PCB Assembly & Soldering
Woodworking
Heat Treatment

Software Proficiency

Solidworks + Simulation
AutoCAD
AutoDesk Inventor
ANSYS Workbench
Simulation Mechanical
Vault and PDM
HSM Works CAM
MasterCAM
Heidenhain CNC Language
Microsoft Office Suite
Syspro ERP

Relevant Projects

2 Axis NC Rotary Table
CVT Tuning Dynamometer
Baja SAE Gearbox Design
Micro CNC Lathe
Baja SAE Throttle Design
Formula SAE Oil Pickup
RC Catamaran
Go-Kart
CNC Plasma Cutter

Interests

Cycling
Hockey
Woodworking
Metalworking
Camping
Canoeing

Welding Engineering, BWXT Canada Ltd, Cambridge, ON
January 2016 – April 2016 (Co-op)
- Analyzed and reported on economics of in-house automatic SAW and GMAW welding processes
- Reviewed manufacturing drawings and developed welding fabrication methods
- Designed machining fixtures for large stress relieved weldments
- Improved chip removal and operator guarding system on HBM cell
- Assisted in developing weld procedure qualifications, testing and reporting
- Improved operation of robotic GMAW and GTAW welding cells
- Aided in planning of PWHT and final delivery of large-scale machine components

Test Engineering Assistant, Ontario Drive and Gear, New Hamburg, ON
May 2015 – August 2015 (Co-op)
- Assembled and troubleshooted prototype gearboxes for various types of vehicles
- Design and tested custom electronic shifting mechanism for two speed transmission
- Assisted with in house Noise, Vibration and Harshness (NVH) tests

Engineering Assistant, Ontario Drive and Gear, New Hamburg, ON
September 2014 – December 2014 (Co-op)
- Designed, manufactured and coordinated purchase of tooling and work-holding for various CNC gear cutting machines
- Operated analytical gear checkers and CMM's when required
- Modified and created machine set-up sheets and process flow routings
- Prepared process and engineering drawing for several projects
- Assisted with development of manufacturing processes

Junior Manufacturing Engineer, Dynaplas, Ltd. Toronto, ON
January 2014 – April 2014 (Co-op)
- Responsible for continuation of student pulley and pulley assembly research and testing project (Noise, Vibration and Harshness)
- Conducted failure analysis and noise tests on products
- Assisted with various process efficiency improvement projects
- Coordinated high efficiency equipment upgrades and associated rebates through saveONenergy program
- Managed and implemented plant 5S/Lean Manufacturing program

Education

Bachelors of Applied Science, Honours Mechanical Engineering, Welding and Joining Specialization,
Co-operative Education Program, University of Waterloo, ON – Graduated April 2018
GD&T AMSE Y14.5-2009: 4-Day workshop hosted by a GDTP-Senior Level instructor – September 2019
ASME Northern Alberta Design Challenge Technical Award: for outstanding fourth-year design projects – April 2018
Advanced Vehicle Dynamics: 4-day seminar for Race Car Design and Development, L'École de technologie supérieure, Montreal, QC – September 2015 – Hosted by OptimumG
Gear Manufacturing: 5-day seminar for industrial gear manufacturing, quality and inspection, Ontario Drive and Gear, New Hamburg, ON – June 2015 – Hosted by ODG
Baja SAE Co-Captain and Lead Team Machinist August 2015 – April 2016

Projects

2 Axis Rotary Table, October 2018-January 2020
- Designed and built 2 axis numerical control AC servo rotary table for manual milling machine
- Integrated inductive and hall effect sensors for machine rotation limits and homing procedures
- Assembled and wired custom Arduino control cabinet with DC power supplies, filters, DIN components and relays
- Fabricated custom hand pendant with LCD display for wired remote control

Baja SAE CVT Tuning Dynamometer, September 2017-April 2018
- Designed and fabricated custom dynamometer for UWaterloo Baja SAE Team
- Analyzed and optimized CVT shifting dynamics to improve vehicle performance

Projects (cont'd)

Baja SAE Gearbox Design (Team Co-Captain), July 2015-September 2015

- Redesigned input, secondary and output shafts to reduce weight
- Conducted FEA studies on two-piece aluminium gear case
- Reduced drive-train system weight by 52%

Baja SAE Front and Rear Drive Hubs (Team Co-Captain), May 2015-Jul 2015

- Developed load cases for front and rear vehicle hubs
- Completed 3D design and conducted stress and displacement analyses
- Coordinated manufacturing with team sponsors and supervised assembly and final vehicle testing

Micro CNC Lathe, October 2014-May 2015

- Manufactured aluminium components to adapt NEMA 23 motors to existing Taig lathe
- Assembled two axis control box to interface with desktop PC via Mach 3 control software
- Documented purchases and expenses to maintain budget

Baja SAE Throttle Design and Manufacturing, June 2014-August 2014

- Evaluated current throttle to determine areas for improvements
- Improved throttle response and return mechanism while reducing overall weight
- Manufactured wooden prototypes to test ergonomics and performance

Formula SAE Oil Swivel Pickup, October 2013-December 2013

- Identified need for swivel pickup, affixed to oil pump
- Assisted by Team Lead and other junior members developed design constraints and created initial design