Herman Grewal

Fourth Year Mechatronics Engineering

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SKILLS

Tools:
CATIA V5, ENOVIA, ANSYS AIM, SolidWorks, AutoCAD

Software:
MATLAB, Simulink, C, C++, VBA

Hardware:
Oscilloscopes, Arduino, FPGA, PLC

Practical:
Soldering, 3D Printing, Laser Cutting, Woodshop

EDUCATION

Bachelor of Applied Science Honours (Co-op)
Mechatronics Engineering
University of Waterloo 2014 - 2019

Academically Ranked in Top 10%
GPA: 3.92/4.00

Relevant Courses: *Electromechanical Machine Design, Thermodynamics & Heat Transfer, Numerical Methods, Dynamics of Machines, Mechanics of Deformable Solids, Materials*

AWARDS

Richard Matzeg Memorial Scholarship
University of Waterloo *Oct. 2017*

Dean's Honour List
University of Waterloo *Apr. 2017*

President's Research Award (x2)
University of Waterloo *May 2016*
Sep. 2015

Aspiring Engineer Scholarship
Professional Engineers Ontario
Jan. 2015

President's Scholarship of Distinction
University of Waterloo *Aug. 2014*

WORK EXPERIENCE

Module Product Designer & Draftsman
Pratt & Whitney Canada, Mississauga, ON *Sep. - Dec. 2016, Jan. 2018 - Current*
» Drafted engineering drawings for compressor components using CATIA
» Created CAD models and conducted tolerance stack ups for production purposes
» Revised detail drawings to reflect manufacturing/assembly capabilities (DFM/DFA)
» Applied GD&T to detail drawings to lower cost & minimize scrap
» Conducted part geometry analysis and prepared presentations for design groups
» Utilized routes and objects in ENOVIA for part progression to production level

Technical Illustrator
Pratt & Whitney Canada, Mississauga, ON *Apr. - Aug. 2017*
» Created assemblies in CATIA for illustrations in service bulletins and parts catalogues
» Visited shop floor to inspect parts and verify assembly procedures
» Utilized ENOVIA to search for engineering documents to verify procedures and parts
» Annotated graphics for technical writers using S1000D standards and best practices
» Communicated with supplier/partner company liaisons to resolve issues quickly
» Instructed and verified work completed by overseas team

Weights Analyst
Pratt & Whitney Canada, Mississauga, ON *May - Aug. 2015, Jan. - Apr. 2016*
» Completed a 40 hour CATIA V5 course by Mecanica Solution
» Performed weight analysis of engine parts and assemblies using CATIA models
» Conducted rotor burst analysis and inertia calculations for critical rotating parts
» Customized Excel worksheets for data collection of historical engine weight data
» Created risk analysis models and statistical analysis of weight data
» Presented findings for manufacturing weight scatter to advance design group
» Created custom macros in VBA for analysis and functionality of data in Excel
» Completed PW308 Engine Assembly Course for hands on experience and familiarity with part functions and assembly procedures

RESEARCH

Prostate Cancer Image Processing Algorithm Analysis
University of Waterloo, Waterloo, ON *Sept. 2016 - April 2017*
» Developed graphic user interface using MATLAB GUIDE
» Processed MRI images to dynamically execute multiple algorithms
» Under supervision of Dr. Alexander Wong in the Vision and Image Processing Lab

Computerized Lung Cancer Analysis
University of Waterloo, Waterloo, ON *Sept. 2015 - Aug. 2016*
» Developed edge detection algorithm for lung cancer analysis
» Utilized MATLAB to process CT scan images and perform statistical analysis
» Abstract publication at Imaging Network Ontario Symposium 2016, "Single-Click Lung Nodule Contouring Method Using a Hierarchical Conditional Random Field"
» Worked in conjunction with Sunnybrook Research Institute
» Under supervision of Dr. Alexander Wong in the Vision and Image Processing Lab

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PROJECT SUMMARY

Remotely Operated Underwater Vehicle (ROUV)
University of Waterloo, Waterloo, ON, CAN *Sep. - Dec. 2017*
» Acted as mechanical lead and project manager for autonomous ROUV project
» Designed PVC pipe frame, 3D printed propeller covers, sensor supports & motor mounts
» Conducted simulated & empirical testing to verify & compare design alternatives
» Utilized diverse tools & materials including drill press, Dremel tool, 3D printer, soldering iron, marine weld & epoxy
» Communicated with electrical and software team members to streamline product integration

Audio Player
University of Waterloo, Waterloo, ON, CAN *Feb. - Mar. 2017*
» Programmed audio player in C using FPGA board
» Utilized SD card to read audio file in chunks to write data to stereo buffers
» Designed user friendly design with multiple button functionality using interrupts
» Built using multiple programs including Altera Toolchain, QSYS, Quartus & NIOS build tools

Bridge Design
University of Waterloo, Waterloo, ON, CAN *May - Aug. 2016*
» Created simplified 2D finite element solver in MATLAB for rapid design evaluations
» Conducted extensive testing on balsa wood sample to empirically determine parameters
» Performed finite element analysis using ANSYS AIM and SolidWorks models
» Utilized power tools for rapid prototyping & laser cut final bridge parts
» Worked with limited resources and completed project in accordance with defined schedule
» Presented final bridge design with justification of design choices in symposium

Line Following Robot
University of Waterloo, Waterloo, ON, CAN *May - Aug. 2016*
» Programmed and constructed line following robot on custom PCB board
» Characterized motors & constructed light sensors using IR LEDs and photodiodes
» Utilized oscilloscope to test and verify component operation
» Integrated multiple sensors including optical encoders, thermistors & hall effect sensors to direct action coded in C
» Calculated values for circuits & soldered components

Temperature Sensor Design
University of Waterloo, Waterloo, ON, CAN *Nov. 2015*
» Utilized thermistor for raw temperature readings
» Processed & calibrated data using Arduino
» Programmed LED display interface with corrected temperature readings with 1°C accuracy

Symptom Tracker and Analysis Project
Hack4Health, Waterloo, ON, CAN *Sep. 2015*
» Designed GUI for multiple sclerosis patient survey of symptoms rated from 1 -10
» Data collected & stored in relational database using user friendly features coded in SQL
» Statistical analysis of data to detect negative trends in symptoms
» Coded macro in VBA to automatically send warning emails to family members/caretakers
» Finalist at Hack4Health competition

Gumball Sorting Robot
University of Waterloo, Waterloo, ON, CAN *Oct. - Nov. 2014*
» Designed and constructed structurally sound robot that sorts gumballs by colour
» Integrated multiple sensors & motors with Lego blocks & coded software in C
» Calculated & displayed efficiency rate, time elapsed & any error messages