Muhammad Bilal Ahmed

2016 Mechanical Engineering, University of Waterloo

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SUMARRY OF SKILLS

Design

- Fixture Design
- Design for Manufacturability
- FEA, Fatigue, Vibration Analysis
- GD&T
- Certified SolidWorks Associate Lean Manufacturing

Manufacturing

- Automation
- Root Cause Analysis
- Design of Experiments
- Metrology Capability Analysis

Software & Electrical

- MATLAB, C++
- Digital Signal Processing
- Data Analytics
- OpenCV (computer vision)
- Motor Control

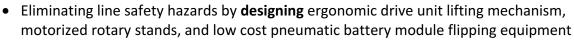
WORK EXPERIENCE

Tesla Motors

Powertrain Remanufacturing Intern

Fremont, CA, USA

Sept. 2016 - Current





- Validating critical fixture components through FEA, fatigue life analysis and prototyping
- Automating adhesive removal by designing an air motor end effector for robotic arm
- Reducing scrap cost by designing tooling to press new bearings onto defective gears
- Developing automated tool for motor noise (NVH) diagnosis using microphones and accelerometers to improve quality. Analyzing vibrations in MATLAB using signal processing

Apple Inc. Cupertino, CA, USA

Manufacturing Quality Engineer Intern

Sept. – Dec. 2015

 Programmed POC software for computer vision based surface defect inspection using MATLAB, OpenCV libraries and CCD hardware



- Led mechanical design of automated inspection machine, for Apple Watch bands and iPhone cases, through design reviews with multiple vendors
- Analyzed yields, QC processes and material flow during visit to Chinese factories, and identified cost saving and quality improvement opportunities

Toyota Motor Manufacturing Canada

Woodstock, ON, Canada

Quality Control Engineering Co-op

Sept. – Dec. 2013



- Resolved quality issues, for RAV 4 assembly, using Toyota Business Practice methodology
- Investigated root cause of high occurrence functional defect; Performed process capability analysis, designed trials, analyzed historical data and measured suspected parts using CMM
- Reduced Quality Control line downtime by discovering false positives from vehicle electronics inspection process and devised countermeasures
- Improved correlation of electric heater test by optimizing thresholds through trials



Singapore University of Technology and Design

Singapore

Vehicle Research Engineer Co-op

May. – Aug. 2014



- Programmed ECU hardware in Simulink to identify mass of electric vehicles using wheel position, motor current and voltage sensors. Achieved 3% accuracy by instrumenting system on the SMART-NUS autonomous golf cart (See: mbahmed.com/sutd)
- Built semi-automated tool to reverse engineer vehicle sensor signals in MATLAB; validated method by decoding CAN bus signals of Mitsubishi iMiev
- Developed software to playback vehicle sensor data to reduce CAN hardware testing time

Instron Norwood, MA, USA

Mechatronics Co-op

Jan. – Apr. 2015



- Increased precision of computer vision based strain gauge by 20% through design of experiments and statistical data analysis in MATLAB
- Quantified effects of temperature, image sensor, air turbulence, calibration, and image processing algorithm on vision strain gauge measurement

Amphenol Canada Corp.

Toronto, ON, Canada

Design Engineer Co-op

Jan. – Apr. 2013

• Designed low form factor connectors, and produced 3D models and drawings in Solidworks

- Amphenol Optimized design of stamped contacts, using FEA, to achieve minimal form factor
 - Gained exposure to GD&T, and Design For Manufacturability (DFM) for injection molded parts

University of Waterloo Rocketry Team

Waterloo, ON, Canada

Mechanical Engineer Co-op

May – Aug. 2012



- Fabricated parts in shop, assembled and performed prototype validation for 20ft liquid bipropellant rocket
- Built launch station, and launched rocket with team for 2012 IREC competition in Utah

EDUCATION & PROJECTS

University of Waterloo

Waterloo, ON, Canada

BASc, Honors Mechanical Engineering - Co-op Program

2011 – Apr. 2016

• Graduated with distinction: **3.7**/4.0 GPA

Autonomous Drone Battery Swapping Station | Capstone Design Project

May 2015 – Apr. 2016

Prototyped robotic battery swapping station for quadrotors using actuator, linear rails and Arduino

Certified SolidWorks Associate | Dassault Systemes

Sept. 2012

More projects showcased at mbahmed.com