Nathaniel Budiardjo Mechatronics Engineering Student

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Education

Bachelors of Mechanical Engineering, *University of British Columbia* 05/2024
Mechatronics Specialization, Dean's Honor List Vancouver, Canada
CGPA: 3.95/4.33
Relevant Coursework: Mechanics of Materials, Machine Design, Manufacturing Methods, Dynamics, Microcontrollers, 3D-Modelling, Heat Transfer, Controls and Automation, Data Systems & Algorithms

Professional Experience

Energy Hardware Intern, *Tesla* 01/2023 – present
Austin, TX
- Designing an electromechanical switch assembly from concept to a production-ready product to manufactured at high-volume scales of 1,000,000+ annually
- Utilizing injection molding and sheet metal design techniques to manufacture enclosures
- Performing FEA simulations to ensure optimal performance of sheet metal and structural performance
- Conducting DFM and DFA reviews with cross-functional teams to optimize time, cost, and overall design quality

Product Design and Manufacturing, *Ability Healthcare* 07/2021 – 12/2022
Vancouver, BC
- Designed a fabricated 15 custom-fitting devices for disabled patients, meeting each individualized needs
- Designed, developed and launched two new assistive products from ideation to launch
- Built custom welding and metalwork jigs and fixtures resulting in a 150% reduction in manufacturing time and increased efficiency
- Utilized a variety of manufacturing techniques, including CNC routing, woodworking, metal fabrication, and welding

Mechanical Design Intern, *TRIUMF* 05/2022 – 08/2022
Vancouver, BC
- Designed and developed a jig to safely disassemble a radioactive target for medical isotope production
- Created GD&T drawings for manufacturing
- Developed a MATLAB script to model the dynamics of a target from first principles through a pneumatic transfer line, achieving a 96% accuracy rate
- Created a thermal test bench and developed a comprehensive test plan to verify CFD simulations using off-the-shelf components

Soft Robotics Researcher, *UBC MEMS Laboratory* 04/2021 – 05/2022
Vancouver, BC
- Devised a novel thermoelastic pneumatic soft actuator for medical applications
- Published a paper on the subject in the ROBOSOFT 2022 Conference
- Formulated and conducted material experiments to optimize the material characteristics for testing 10 types of shape-memory polymers
- Designed a PWM pressure and PID temperature controller to regulate a position, providing precise control over actuator performance

Projects

Modular CNC, *Personal Project*
- Designed and fabricated a 3-axis CNC capable of operating as a plotter, router, and laser engraver
- Used machine design principles to specify components such as bearings, lead screws, and stepper motors
- Utilized readily available materials such as plastics, wood, and metal to design and build a CNC router under $200

G-Code Modifier, *Personal Project*
- Developed a Python script that automated the editing of G-Code for a 3D printer, streamlining the modification of multiple G-Code files simultaneously when executed

Skills

Manufacturing (DFMEA, 3D printing (FDM, SLA, SLS, MJF), Mill, Lathe, CNC, Welding, Water Jet/Laser Cutting, Injection Molding, Sheet Metal)

Mechanical (SOLIDWORKS, CATIA, FEA Simulations, Design for X, Design for Manufacturing and Assembly)

CS/EE (Microcontrollers, Arduino, Stepper Motors, Servo Motors, Soldering, FPGA, PWM control, Python, C/C++, MATLAB, Simulink)

Technical Knowledge (FMEA, PFMEA, Material Selection, GD&T, DFM/DFA, Design for X, Root Cause Analysis)