Alexander Vandenberg

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Education

Northeastern University, Boston, MA *Dec. 2023*
Bachelor of Science in Mechanical Engineering, Minor in Mathematics
GPA: 3.92
Courses: Capstone Design, Thermal System Analysis and Design, System Analysis and Control, Mechanical Engineering Design, Mechanical Engineering Computation, Measurement and Analysis, Matrix Methods for Machine Learning
Activities: AerospaceNU Simulation, American Society of Mechanical Engineers, Club Spike Ball, Intramural Softball

Work Experience

Northeastern University, Boston, MA *Sep. 2022 - Dec. 2023*
Mechanical Engineering Tutor
- Provided support to students in homework, projects, and exam preparation, resulting in a notable improvement of a student's grade in Thermodynamics from an F to a C
- Tutored students in Measurement and Analysis, Fluid Mechanics, Dynamics, Thermodynamics, Mechanics of Materials, and Statics
- Offered advice related to finding engineering co-ops, on campus employment, and class registration

Eemax/Rheem, Waterbury, CT *Jan. 2022 - Jul. 2022*
Mechanical Engineering Co-op (Innovation, R&D, NPI, QA)
- Redesigned flagship water heating core to improve flow quality and save $35,000 by means of material reduction
- Fabricated SolidWorks flow simulations to validate new concepts for tankless electric water heaters
- Performed IP research and contributed to multiple potential patents, including “Insulated Tank with Diaphragm,” “Water Heater Inductive Charging,” “Cotton Tablet Leak Stop,” and “Hydrogen Powered Water Heater”
- Increased performance and stability of red tag data entry system by migrating it from C++ to Excel VBA
- Prototyped several designs for heating element removal wrenches, and confirmed prototypes would not fail up to 50 ft-lb of torque using FEA and physical testing

Projects

Mechanical Engineering Capstone *Jul. 2023 - Dec. 2023*
Automatic CNC Chip Remover
- Designed, manufactured, and constructed a screw auger chip removal system for a Tormach 1100M CNC machine in Northeastern University’s machine shop
- Reduced time needed to clean out CNC chips from 10 minutes manually to 45 seconds automatically
- Implemented 4 holes in CNC base to install a custom discharge, on/off switch, and screw auger trough
- Calculated a minimum power requirement of 4.32 W to expel metal chips from CNC base, and selected a DC motor to meet size, power, torque, and speed constraints

Eemax/Rheem *May. 2022 - Jul. 2022*
Heating Core Redesign
- Reduced unwanted hot spot temperatures in flow simulations by 19°F by directing more water flow past heating core
- Optimized part design by hollowing out external walls and integrating thin ridges, resulting in a 26% reduction in material costs and $35,000 in annual savings
- Developed 3D printed and injection molded prototypes to confirm proper water flow through heating element

Skills

Applications: SOLIDWORKS (CFD and FEA), ABAQUS, AutoCAD, 3D Printing, Ansys Fluent, Microsoft Office 365
Programming Languages: MATLAB, Excel VBA, C++, Python