**Alexander Vandenberg**

[vandenberg.a@northeastern.edu](mailto:vandenberg.a@northeastern.edu) | (845) 464-0097 Portfolio: [alexandervandenberg.github.io/portfolio](https://alexandervandenberg.github.io/portfolio)

254 Fayville Road, Galway, NY 12074 LinkedIn: [linkedin.com/in/alexander-vandenberg](https://www.linkedin.com/in/alexander-vandenberg/)

**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