



Mark Verosky

mverosky@gmail.com | 412-552-8658 | [.linkedin.com/in/markverosky](https://www.linkedin.com/in/markverosky) | Portfolio: markverosky.com

EDUCATION

The Ohio State University - Columbus, OH

GPA: 3.55/4.0

M.S. Mechanical Engineering, Graduation: May 2020

- As part of my degree, I successfully defended my thesis in front of a committee.

The Ohio State University - Columbus, OH

GPA: 3.73/4.0

B.S. Mechanical Engineering, Magna Cum Laude with Honors Research Distinction, Graduation: May 2018

Honors: Engineering Dean's Scholarship (2014-2015), Outstanding Freshman Award (2014-2015), Nicholson Scholarship (2015-2016), Name & Seal Scholarship (2016-2018), Cohen Scholarship (2017-2018), Wildermuth Scholarship (2017-2018), Engineering Research Scholarship (2017-2018), and National Buckeye and Provost Scholarships (2014-2018)

WORK EXPERIENCE

The Ohio State University Thermal Materials Laboratory under Dr. Joseph P. Heremans • Columbus, OH

Student Associate/Researcher • January 2017 – May 2020

- Created computer programs in MATLAB that simulated thermoelectric device performance and determined optimized device geometry. This insight was then used to construct a device and measure its performance. Collected data were analyzed using MATLAB, and the experimental performance was evaluated against simulations.
- Developed LabVIEW programs to perform automated laboratory measurements on material properties and device performance.
- Designed laboratory test procedures to accurately measure the thermal transport properties of materials and device performance. For some experiments this required modification of laboratory equipment so that it could be used in new ways. Calculations were performed to ensure equipment could withstand the new test procedures and provide accurate measurements.
- Troubleshoot laboratory test equipment using a root-cause analysis to determine the fault of the system. Used the results of this analysis to fix laboratory equipment by ordering correct components, installing them, and then recalibrating equipment.
- Set up and calibrated new laboratory equipment under a deadline for use in precise laboratory measurements. Developed standard operating procedures (SOPs) for new test equipment.
- Investigated common thermoelectric materials for use in a thermal switch and active cooling devices. These projects were later published in academic journals and presented at conferences. These articles can be provided upon request.
- Conducted experiments on a portable thermoelectric device as a means of micropower production – Undergraduate thesis.
- Performed tests on a thermoelectric combustion chamber for power production that utilized a counterflow heat exchanger.
- Synthesized air-sensitive materials in a glove box, which were then sintered with the use of a spark plasma sintering (SPS) machine.

The Ohio State University Department of Mechanical and Aerospace Engineering • Columbus, OH

Head Graduate Teaching Assistant (GTA) • January 2020 – May 2020 | GTA • August 2018 – January 2020

- GTA for senior capstone design course series for three semesters and machine design & kinematics for one semester.
- Managed up to 36 different projects at one time. This required providing technical insight, ensuring teams made timely progress, and reviewing project documents. Required the use of various Microsoft Office applications.
- Aided students in developing project requirements and utilizing these requirements to aid in concept generation.
- Conducted design reviews with teams that involved confirming the accuracy of FEA models and simulations, reviewing manufacturing plans, and verifying designs were meeting requirements.
- Guided teams through the engineering design process and ensured they met project deadlines. This involved aiding teams in the development of manufacturing plans and developing ways to find a compromise between conflicting requirements.
- Helped students in identifying risks with their projects and developing mitigation strategies.
- Assisted students in developing test plans, executing the plans, and troubleshooting test equipment when necessary.

Bally Design • Pittsburgh, PA

Industrial design firm that provides product design and other services to various industries.

Engineering Intern • May 2017 – August 2017

- Brainstormed with industrial designers to develop solutions for customer problems.
- Created functional prototypes for a camping chair and advanced paper towel holder based on SolidWorks models using materials such as woods, plastics, foams, and metals. Utilized tools such as a mill, band saw, and drill press for fabrication.
- Performed engineering analysis and testing of functional prototypes of products such as a camping chair and advanced paper towel holder to ensure they met specifications while considering large-scale manufacturing, durability, and user-friendliness.
- Designed, analyzed, constructed, and tested a prototype device for a butter cooler utilizing a Peltier module. This involved developing a program in Python that analyzed the thermal effects of altering geometry and components of the device.

Dominion Resources Inc. • Mount Storm Power Station, WV

Mechanical Engineering Intern • May 2016 – August 2016

- Completed an underground piping risk survey before the set deadline by utilizing Microsoft Excel and both technical and plot drawings to determine the location, length, size, and material of various underground pipes.
- Conducted testing for a variety of power plant equipment during an outage to ensure that they were functioning properly before the units were brought back online.
- Worked with individuals in conditioned based maintenance (CBM) to perform vibrational analysis on plant equipment.

Forefront Product Design LLC • East Pittsburgh, PA

Small product design firm located outside of Pittsburgh, PA. Forefront has multiple patents on automated spray system technology that is utilized in the pest control industry. The company's product, Green Gorilla, is assembled and tested in-house.

Electro-Mechanical Assembly Technician • May 2013 – August 2015

- Performed electro-mechanical tasks in the assembly of a commercial pressure system.
- Developed and performed tests on electronic and mechanical products to ensure they met company specifications.
- Analyzed and refined assembly processes and procedures by addressing ways to optimize production.
- Created specialized manufacturing equipment to speed up the manufacturing time.
- Worked alongside senior engineers to modify the spray system to meet the different needs of various customers.
- Applied lean manufacturing techniques to streamline the manufacturing of different components of the spray system.
- Led assembly line activities and ensured product's time-to-market was met while also maintaining the quality of the product.

RELEVANT PROJECT EXPERIENCE

Senior Capstone Design Project • August 2017 – April 2018

- Designed a human-powered vehicle to be used for transportation at the Burning Man Festival. This involved merging engineering design with art. One aspect of this project involved designing and manufacturing a bicycle-to-tricycle conversion kit.
- Performed concept generation with team members to develop potential ways to convert a standard bicycle into a tricycle.
- Accurately measured and constructed a 3D CAD model of the bicycle frame in SolidWorks. Used this model to create various prototypes in CAD that were then analyzed using FEA (ANSYS). Verified FEA results via hand calculations and tests.
- Utilized FEA results to determine materials for the conversion kit components, alter CAD models to reduce the overall stress on the system, and make modifications to allow free motion of the chain between the front and rear gears of the bicycle.
- Developed methods to deal with conflicting requirements to ensure the best leading solution was delivered by the team.
- Consulted with manufacturing experts throughout the design process to ensure parts could be manufactured to tolerance. This required construction of a bill of materials BOM, providing properly dimensioned drawings according to GD&T standards, and developing manufacturing process instructions (MPI).
- Performed design reviews to show the evolution of the design process. Constructed a final functional prototype of the vehicle and evaluated its performance through a series of tests.

Machine Signature Analysis • August 2017 – September 2017

- Developed a sensor-based metric to determine defects in the mounts of an air compressor and the location of the failing mount.
- Performed spectral measurements on an air compressor unit. Conducted a spectral analysis of the collected data.
- Quantified differences in acceleration signatures of an air compressor under different operating conditions (speed, pressure load, and worn mounts). Examined how data acquisition and signal processing parameters influenced spectral measurements.
- Created a robust set of metrics to determine mount failure and assessed the robustness of these metrics while considering measurement variations and operating conditions. Presented this information in front of peers and instructors via PowerPoint.

ADDITIONAL SKILLS

- **Computer software:** SolidWorks, Pro/ENGINEER (PTC Creo), MATLAB, MathCAD, Python, AutoCAD, ANSYS, Abaqus, Simulink, LabVIEW, EES, Arduino, Microsoft Office, Smartsheet, Microsoft Teams, and Adobe Photoshop
- **Machines:** Mill, lathe, band saw, drill press, MIG welder, TIG welder, stick welder, plasma cutter, soldering, SPS, Arc Melter, XRF

PUBLICATIONS & PRESENTATIONS

1. Adams, M., Verosky, M., Zebajadi, M., & Heremans, J. P. (2019), Active Peltier coolers based on correlated and magnon-drag metals. *Physical Review Applied*, 11(5), 054008, doi: 10.1103/PhysRevApplied.11.054008
2. Verosky, Mark. "High Switching Thermal Switch using a Peltier Couple". *2019 MRS Spring Meeting & Exhibit, April 22-26, 2019 | Phoenix, AZ*. 24 April 2019.
3. Adams, M., Verosky, M., Zebajadi, M., & Heremans, J. P. (2018). High switching ratio variable temperature solid-state thermal switched based on thermoelectric effects. *International Journal of Heat and Mass Transfer*, 134, 114-118. <https://doi.org/10.1016/j.ijheatmasstransfer.2018.12.154>.