Zach Kutschke

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Education

Johns Hopkins University — **Baltimore, MD**
Ph.D. in Mechanical Engineering — *August 2024 – Present*

Massachusetts Institute of Technology — **Cambridge, MA**
B.S. / M.S. in Mechanical Engineering — *September 2017 - June 2023*

- Exchange student at ETH Zürich, Switzerland in 2020.

Professional Experience

Applied Physics Laboratory (JHU) — **Laurel, MD**
Combat System Analyst – Air & Missile Defense Sector — *August 2023 – Present*

- Streamlining data analysis and reporting of Aegis & TSCE ship testing & events. Analyzing weapon control system data.
- Assisted in research and development for a novel maritime search and rescue system.

Mechanosynthesis Group (MIT) — **Cambridge, MA**
Graduate Research Assistant — *September 2021 – June 2023*

- Finalized and characterized a modular precision LPBF system to enable in house multilayer metal printing.
- Created a novel LPBF-inkjet system to enable printing functionally graded parts in new refractory alloys.

Pure Watercraft — **Seattle, WA**
Mechanical Engineer — *February 2021 – July 2021*

- Created a rig and performed log strike testing on outboard motors to ensure user safety.
- Developed test equipment for a variety of PCBs and other system components.
- Designed and constructed an end of line dynamometer to verify the functionality of completed outboards.

Impact and Crashworthiness Lab (MIT) — **(Remote)**
Undergraduate Researcher — *May 2020 – December 2020*

- Developed physics-informed neural networks to solve unsteady heat transfer problems and supplant finite element solvers in modelling thermal runaway of damaged lithium-ion batteries.

Pure Watercraft — **Seattle, WA**
Mechatronics Intern — *June 2020 – August 2020*

- Developed test equipment to validate the BMS, battery control boards, and throttle construction.
- Designed and implemented data acquisition unit to analyze gearbox pressures and inform decisions on its valving.

BD Medical - Advanced Diabetes Care — **Andover, MA**
Research and Development Intern — *June 2019 - August 2019*

- Prototyped automated testing equipment to improve manufacturing efficiency of latest insulin delivery device.
- Supported the development of a new leak rate test method for critical modules of new insulin delivery device.

Musashi Auto Parts - Michigan — **Battle Creek, MI**
Engineering Intern — *June 2017 - August 2017 & June 2018 - August 2018*

- Designed and fabricated a computer-controlled tool cart to aid in machine installation.
- Determined the acceptable leak rate of gear assemblies and generated production specifications to reduce bad parts.

Leadership Experience

MIT Solar Electric Vehicle Team — **Cambridge, MA**
Business Lead & Mechanical Engineer — *September 2018 – December 2020*

- Designed & manufactured parts of the mechanical system. Trained teammates on machining, welding, and basic FEA.
- Spearheaded team sponsorship efforts leading to an acquisition of over $90k to support team operations.

Skills

SolidWorks, Arduino, MATLAB, Python, COMSOL, Machining & Welding.