PATRICK WILSON

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EDUCATION

Duke University, Pratt School of Engineering Durham, NC

Master of Engineering (M.Eng.) in Mechanical Engineering, 3.4/4.0 GPA ***Expected Dec 2022***

Bachelor of Science in Engineering (B.S.E.) in Mechanical Engineering, 3.3/4.0 GPA ***May 2022***

TECHNICAL SKILLS

CAD Modelling:	SolidWorks	Autodesk Inventor	Autodesk Fusion 360	Onshape	FreeCAD	SketchUp
Hardware:	3D Printing	Laser Cutting and Engraving	Tensile Testing	Carbon Fiber Layup	Fiberglass Layup	Machine Shop CNC Mill and Lathe
Software:	Python	MATLAB	Maple	OpenRocket	Flutter	Visual Studio Code

ENGINEERING EXPERIENCE

NASA Academy Team Lead, Langley Research Center June 2022 – *Present*

- I lead a team of Academy interns addressing current wildfire needs using NASA technology, working towards reducing the over 6,000 structures destroyed in the US each year. I am Subject Matter Expert on mechanical engineering, serving as a resource for team members to consult on mechanical design.
- I plan agendas for daily meetings and lead the weekly presentations to our NASA advisory committee.

NASA Academy Research Associate, Langley Research Center May 2021 – Jan 2022

- My team of engineering interns full stack developed a mobile app, utilizing Visual Studio Code, GitHub, Flutter, Dart, and MySQL. The app is an avenue to report fires, allowing users to submit photos and locations of active wildfires and directly adding that data to the common operating pictures used by incident command. The app is unique in harnessing many observations in near real-time to assist in monitoring what is happening and where people and infrastructure are at immediate risk.
- I wrote a portion of the group technical report published to the NASA Technical Reports Server detailing the app, development process, and proposed beta testing plan. I worked full-time in the summer and part-time in the fall.

Lead Mechanical Engineer, Team Silo, Engineering 101 Project August 2018 – May 2022

- We designed a low-cost locally produced silo bag to assist in the surgical treatment of babies born with Gastroschisis in Sub-Saharan Africa. Mortality from the condition often exceeds 90% in SSA while being less than 4% in high-income countries. Our bag costs less than $1 to produce compared to $240 for standard of care silos and can be sustainably manufactured in Uganda using locally available materials.
- We have conducted an in vivo study that found similar ease of use, absence of tissue injury, and acceptable microbiology profile similar to SOC silos. A clinical trial has IRB approval and begins in June 2022.
- I prototyped and designed our device in CAD, as well as kept contact with our many collaborators. I lead the durability testing, measuring ultimate tensile strength of our device using a Tinius Olsen 1000.
- Achievements: ▪ Published in the Journal of Surgical Research, Volume 255 ▪ Presented at American College of Surgeons Clinical Congress 2019 ▪ 2021 Bay Area Global Health Innovation Challenge Winners ▪ 2020 NIH DEBUT Challenge 3rd Place ▪ 2021 Lemelson-MIT Student Prize Finalists ▪ Won 2020 Baquerizo Innovation Grant

Recovery Engineering Lead, Duke AERO Rocketry Team August 2020 – *present*

- I lead the design and build of the recovery system for the 30k foot rocket, and I am responsible for hosting team meetings, CAD design, and testing for safety and reliability.
- I spec'd parachutes, shock cord, quick links, and attachment bolts and performed descent rate and shock calculations to ensure a safe recovery. OpenRocket simulations were conducted to confirm the calculations.

Electro-Acoustical Engineering Intern, Parseval Sound June 2018 – August 2018

- I modelled and 3D-printed a custom case for a Raspberry Pi with SolidWorks CAD.
- I contributed to the design and development of mobile app systems and interfaced with one client directly.

LEADERSHIP EXPERIENCE

Corporate Relations Chair, Duke AERO Rocketry Team May 2021 – *present*

- I was the Executive Board member responsible for creating outreach material and contacting companies seeking funding, support, and opportunities for our club members.

Section Wars Commodore, Duke University Marching Band May 2019 – May 2020

- I organized a friendly inter-section competition to promote camaraderie across the band.

Lab Teaching Assistant, First Year Design at Duke University August 2020 – December 2021

- I helped students design project ideas and use tools, machines, and CAD to create functional prototypes.

Lab Assistant, Duke University Pratt School of Engineering January 2022 – May 2022

- I maintained lab safety, cleanliness, and organization, mentored other students on the use of equipment, acted as a liaison between students, faculty, and staff, and enforced laboratory safety policies.