John F. Cummings

Experience in research, internships, and a Formula One style engineering team have provided me with the sense of intuition and collaborative skills required to solve complex engineering problems.

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Education

Lehigh University — **Bethlehem, PA**
Bachelor of Science in Mechanical Engineering — *May 2021*
Minors: Aerospace Engineering, Business

Work Experience

SAVIT Corporation — **Rockaway, NJ**
Mechanical Engineering Intern — *May – August 2019*

- Interim security clearance, full secret clearance pending.
- Designed a precision levelling device to accurately calibrate mortar aiming sights, allowing us to calibrate these devices in house.
- Reduced human dependency in assembling, disassembling, and optically evaluating the XM11-13 Rocket Assisted Projectile by the designing and implementation of high torque fixtures.
- Worked on a small team to integrate electronic and mechanical parts in the production of prototypes and perform research on polyether ether ketone (PEEK) 3D printing.
- Performed geometric dimensioning and tolerancing (GD&T) on designs, improving manufacturing accuracy of parts.

Project Experience

Additive Manufacturing: Life Analysis Research Group — *August 2019 – Present*
Undergraduate Research Assistant

- Working on a research group studying the properties of 3D printed metals as they compare to wrought material.
- Tasked with modelling the predicted strength of 3D printed parts made by an in-house Gas Metal Arc Welding (GMAW) printer based on data from thermal images and audio recordings collected while printing.
- Used live thermal and sound data to optimize printing in real time to evaluate grain growth and reduce defects.
- Will perform appropriate static and dynamic mechanical tests required to quantify how printed material properties compare to wrought materials.
- In the process of implementing light detection and ranging (LIDAR) scanning in the evaluation and fault detection of parts.

Lehigh Formula SAE Racing Team — *August 2017 – Present*
Driver Ergonomics Design Lead (May 2018 – Present)

- Designed and fabricated an ultralight carbon fiber seat that optimizes the placement of the driver to lower center of gravity, increase comfort, and provide stability during high accelerations.
- Assisted in the implementation of a custom-made dashboard giving the driver their speed, optimal shift time, gear position, engine temperature, and the battery voltage.
- Designed and manufactured a composite steering wheel with custom 3D printed grips reducing weight by 50 percent.
- Implemented additive manufacturing as a way for composite molding and jigging as a cost-effective replacement for conventional methods.

Aerodynamics Designer (August 2018- Present)

- Designed the aerodynamic nosecone reducing drag while minimizing weight and cost.
- Used FDM and SLA printing in the molding of the side-pods, intake manifold, and nosecone.

Suspension Designer (June 2019- Present)

- Successfully integrated new members onto the team through teaching them SolidWorks, leading freshman projects, and teaching them manufacturing methods.
- Working with other sub-teams to decrease overall weight specifically through the integration of double flexure composite A-Arms.

Warfighter Engaged Charity — *May 2019 – Present*
Manufacturing Volunteer

- A charity devoted to improving the lives of severely injured and disabled veterans with custom adapted recreational items and other solutions to provide greater independence.
- Assisted with the overall design and prototyping process of custom adapted video game controllers to increase manufacturability.
- Utilized SLA printing in the production of reusable molds for small scale production of parts.
- Working on designing aluminum molds for injection molding parts for large scale production.

Skills

Programs: SolidWorks, PTC Creo, AutoCAD, Microsoft Office, Finite Element Analysis (FEA), Arduino (C/C++), LabVIEW
Technical Knowledge: Additive Manufacturing, Geometric Dimensioning and Tolerancing (GD&T), Machining, TIG Welding, MIG Welding, Injection Molding