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.
- Assisted in the mechanical analysis of different adhesives for the bulkhead insulation on the XM11-13 Rocket Assisted Projectile.
- Reduced human dependency in assembling, disassembling, and optically evaluating the XM11-13 Rocket Assisted Projectile by the designing and implementing of high torque fixtures.
- Worked on a small team to integrate electronic and mechanical parts in prototypes and perform research on 3D printing with polyether ether ketone (PEEK), a polymer with high temperature and strength applications.
- Performed Geometric Dimensioning and Tolerancing (GD&T) on engineering drawings, improving the manufacturing accuracy of parts.

Project Experience

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

- Working on a research team studying the microstructure of additive manufactured metals as it compares to that of wrought metals through static and dynamic tests.
- Tasked with modelling the 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.
- Using live thermal and sound data to optimize printing in real time to optimize grain growth and reduce defects.
- Implementing Light Detection and Ranging (LIDAR) scanning in the live 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 the center of gravity of the car, increase comfort, and provide stability while under high accelerations.
- Assisted in the implementation of a custom-made dashboard giving the driver their speed, optimal shift time, gear position, engine temperature, and battery voltage.
- Designed and manufactured a composite steering wheel with custom 3D printed grips, reducing weight of the wheel by 290 grams (50%).
- Implemented additive manufacturing as a way for composites molding and tube jigging as a cost-effective solution in comparison to conventional methods.

Aerodynamics Designer (August 2018- Present)

- Designed and manufactured the nosecone and sidepods increasing aerodynamics while minimizing weight and manufacturing cost.
- Utilized 3D printed water molds to produce the composite intake, allowing us to produce hollow parts not possible with conventional manufacturing techniques.

Suspension Designer (June 2019- Present)

- Integrated new members onto the team through SolidWorks demos, leading freshman projects, and teaching 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

- Helping to improve the lives of severely injured and disabled veterans with custom adapted recreational items and other solutions to provide them with 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 the small-scale production of parts.
- Working on producing aluminum molds for the large-scale injection molding of controller parts, increasing the charities outreach.

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