John F. Cummings

Experience in internships, research, and a Formula One style engineering team in various industries have provided me with the sense of intuition and technical 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

Professional Experience

Relativity Space — **Los Angeles, CA**

- *Relativity Space is a Launch Provider automating the manufacturing of rockets by integrating intelligent robotics, software, and proprietary metal 3D printing technology with an overarching goal of making space more accessible.*

Additive Hardware Intern — *August 2020 – Present*

- Assisting with the design and manufacturing of the world's largest 3D printers, tackling problems never seen before.
- Designing integrated hardware to improve the autonomy, print quality, and reliability of these printers.

Structures Intern — *May – August 2020*

- Responsible for the design, analysis, and manufacturing plan of the flight side Hold Down brackets and Quick Disconnection Plates.
- Assisting with the design of adjacent structures and Ground Support Equipment that interface with the Hold Downs and Quick Disconnects.

SAVIT Corporation — **Rockaway, NJ**

Mechanical Engineering Intern — *May – August 2019*

- Obtained Secret Security clearance.
- Assisted in the mechanical analysis of different adhesives for the bulkhead insulation on the XM11-13 Rocket Assisted Projectile.
- 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

Undergraduate Research Assistant — *August 2019 – Present*

- Working on a research team tasked with studying the microstructure of additive manufactured metals in comparison to wrought metals.
- Modeling the strength of 3D printed parts made by an in-house Wire Arc Additive Manufacturing (WAAM) printer based on thermal, audio, and physical data.
- Using collected data to evaluate how to adapt printing in real time to optimize grain growth and reduce defects.

Lehigh Formula SAE Racing Team — *August 2017 – Present*

Chassis Team Designer — *June 2020 – Present*

- Responsible for teaching SolidWorks to new members.
- Designed and manufactured a novel pedal box which greatly simplifies manufacturing without sacrificing weight, ergonomics, or functionality.

Driver Ergonomics Design Lead — *May 2018 – June 2019*

- Developed an ultralight carbon fiber seat and composite steering wheel, using 3D printing to produce molds and increase ergonomics through custom designed driver interfaces.
- Implemented additive manufacturing in composites molding and tube jigging as a cost-effective and ergonomic replacement for conventional methods of manufacturing.

Aerodynamics Designer — *August 2018- June 2019*

- Assisted in the designing and manufactured the nosecone and sidepods, increasing aerodynamics while minimizing weight and manufacturing cost.

Skills

Programs: Siemens NX, Ansys, PTC Creo, SolidWorks, AutoCAD, Microsoft Office Suite, Finite Element Analysis (FEA), Arduino (C/C++), LabVIEW, MATLAB

Technical Knowledge: Structures Analysis, Additive Manufacturing, Geometric Dimensioning and Tolerancing (GD&T), Machining, TIG Welding, MIG Welding, Injection Molding