Patrick Trunfio

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Design Portfolio: Github.com/patricktrunfio/Engineering-Portfolio

EDUCATION

University of Southern California, Viterbi School of Engineering Los Angeles, CA
Bachelor of Science, Mechanical Engineering May 2022
Major GPA: 3.857/4.0 | Cumulative GPA: 3.764/4.0
Honors: Provost Research Fellow, W.V.T. Rusch Engineering Honors Program – Technology, Innovation and Entrepreneurship Track, Alpha Lambda Delta Honor Society, Seeley Mudd Viterbi Scholarship recipient, Deans List: Fall 2018, Fall 2019, Spring 2020, Fall 2021
Relevant Coursework: Senior Projects Laboratory, Mechoptronics A & B, Computer-Aided Design of Mechanical Systems, Aerospace Structures, Thermodynamics I, Strength of Materials, Dynamics of Fluids, Dynamic Systems

EXPERIENCE

University of Delaware Cooperative Extension Newark, DE
4-H Program Assistant May 2021 - August 2021
- Developed and taught hands-on STEM curriculum to youth through summer camps, classes, and public fairs.
- Reached 100s of youth with programming on subjects including 3-D modeling, 3-D printing, programming, and circuitry.

New Process Fibre Company Greenwood, DE
Mechanical Design Intern June 2020 - August 2020
- Led project to automate stamping production of thermoplastic parts. Designed, manufactured, and tested a new feed system machine with a goal of reducing labor by threefold.
- Coordinated purchasing and project management while reporting directly to plant manager.
- Gained metal fabrication skills while building and troubleshooting prototypes using mills, lathes, bandsaws, grinders, and other related equipment.

USC Dornsife Department of Physics and Astronomy Los Angeles, CA
Lab Assistant, Demonstration Lab August 2018 - May 2020
- Worked with professors to set up technology and experiments necessary for lectures.
- Responsible for physical set up, take down, and in some cases operation of lecture demonstrations.

Delaware Department of Transportation Dover, DE
Engineering Intern: Materials and Research (2019), Utilities (2018) June 2018 - August 2019
- Conducted laboratory tests on hot mix pavement as part of daily asphalt plant inspections.
- Reviewed detailed road, bridge, and construction plans to identify conflicts between utilities and proposed construction.
- Communicated with utility companies to advise on relocation procedures.

PROJECTS

Effects of Orifice Configuration on the Spray Cone of a Pintle Rocket Injector August 2021 - Present
- Senior Design Project designing experiment to evaluate how pintle geometry effects mass flow distribution.
- Implemented PID Tuning to electrical pressure regulator system to decreases variability of system by 1,000%
- Designed custom testing rig to collect mass flow data within 5° using Siemens NX.
- Received A in course and were recommended for publication in the Journal of Propulsion and Power where publication is currently being pursued

Research Assistant May 2020 - Present
- Member of Professor Anita Penkova's Research group, leading a team of 3-5 students designing an isolation PPE device to provide a protective barrier between infected patients and healthcare workers.
- Used Siemens NX to model a full device prototype that was then used in structural and motion simulations using NX Nastran.
- Used ANSYS Fluent to execute CFD simulations to validate product viability.

USC Solar Car Design Team August 2019 - May 2020
- Member of Mechanical Team specifically responsible for the design and modeling of the vehicle's lower shell; used SolidWorks to create mockup of vehicle's chassis to aid in design of vehicle's body.
- Constructed battery ventilation system and other vehicle components using composites.

College Football Ranking System August 2019
- Created a MATLAB script that imported basic and advanced stats from FBS teams and used weekly results to compute a ranking for each team.

SKILLS

Software: Solidworks, Siemens NX, Autodesk Inventor, OnShape. MATLAB, Ultimaker Cura, Microsoft Office, NI LabVIEW
Machining: Mill, Lathe, Drill Press, Band Saw, Grinder, 3-D Printing, Laser Cutter