

John Arey

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EDUCATION

Northwestern University

Evanston, Illinois

Bachelor of Science in Mechanical Engineering

Anticipated June 2022

- GPA: 3.38/4.00 (Major GPA 3.78)
- Honors/Awards: Dean's List High Honors Winter 2020 & 2021, Dean's List Honors Fall 2020, Spring 2021
- Relevant Coursework: Computer Integrated Manufacturing, Advanced Solid Modeling, Mechanics of Materials, Scientific and Embedded Programming in Python, Mechanical Design and Manufacturing

PROJECTS

Northwestern Formula Racing

Evanston, Illinois

Lead Chassis Engineer

September 2018–Present

- Managed the Chassis Subteam, organizing team trainings, meetings, project timelines, purchasing, quality control, new member education, as well as communication with other subteams
- Designed full steel tube space frame for 2020-21 FSAE car in compliance with FSAE rules, validating design via Finite Element Analysis and torsional stiffness testing
- Designed ergonomics components for 2019-20 FSAE car (seat, head and safety restraints, firewall, floors, dashboard) and improved floor panel fits to be well below the required 3mm tolerance
- Designed and manufactured fixtures to facilitate precise vehicle chassis geometry in welding for 2018-19 car
- Revamped composite layup process (carbon fiber & Nomex core) to achieve quicker, more uniform results, and wrote documentation detailing this process for future use
- Constructed testing rig for impact attenuator testing, and validated its performance both with Finite Element Analysis and in a real-world quasi-static crush test to ensure driver safety and to confirm FSAE rules compliance

EXPERIENCE

Power Solutions International

Wood Dale, Illinois

Manufacturing Engineering Intern

June 2021–September 2021

- Collaborated with manufacturing and quality engineers on custom tooling and fixtures
- Designed and manufactured custom hand-operated impact tools to remove valve seats from engine blocks
- Developed a set of adapters for the valve guide inspection borescope and demonstrated their use to company stakeholders, saving an estimated \$1300 in additional equipment
- Conducted casting quality checks and worked alongside
- Quality Control to identify issues
- Designed an improved fixture plate for 32L engine heads for use in the CMM lab, improving part stability under rapid machine movement and allowing for quick removal and installation of the part
- Machined custom fixtures to facilitate head bolt torquing for 5.7L engine heads using the in-house shop
- Identified and sent 300+ expired gages for recalibration, approved certified gages for use on factory floor
- Wrote Python scripts to shorten the input process of scanned calibration certificates into company software (Altegra GageManager) from 1 hour to 5 minutes

Northwestern Segal Design Institute

Evanston, Illinois

Segal Shop Trainer

November 2020 - Present

- Instruct and train McCormick engineering students in the Segal Prototyping Lab on machine operation, including CNC vertical mills, manual mills & lathes, laser cutters, and hand tools
- Demonstrate operation of shop machinery, and assist students with manufacture of projects
- Observe student work and maintain safety, cleanliness, and organization in the shop
- Work alongside Segal shop professionals on personal projects and education formatting

SKILLS & INTERESTS

Computer Skills: Solidworks CAD & FEA, NX CAM, ANSYS FEA, MATLAB, Python, C, C++, Excel

Manufacturing skills: GD&T, CAM, CNC Mill, Manual Mill, Manual Lathe, CO2 Laser Cutter, TIG Welding

Hobbies: Car maintenance, Skateboarding, Die-cast car collecting, PC building