Andrew Park

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EDUCATION

University of Illinois at Urbana-Champaign, Grainger College of Engineering   **Expected December 2026**
Bachelor of Science in Mechanical Engineering; Minor in Electrical Engineering, Spanish   Cumulative GPA: 3.96/4.0
Relevant Coursework: Compressible Flow, Aerodynamics, Robotics, Design for Manufacturability, Vibrations, Solid Mechanics,

EXPERIENCE

Design Engineering Intern, Caterpillar, Inc. **– Pontiac, IL**   **May 2025 – August 2025**
- Spearheaded the design and development of a real-time temperature monitoring system for solenoids, enabling early detection of thermal failure and significantly reducing unplanned downtime and costly replacements
- Engineered a custom microcontroller-based solution with 1°C accuracy and 32ms sampling, interfacing with relays, current sensors, a DAQ, and private display software using USB and other communication methods
- Designed and assembled a new fixture adapted to unique injector geometries in CREO, facilitating disassembly by allowing users to bypass having to release torque on key components

Course Grader, University of Illinois Urbana-Champaign **– Champaign, IL**   **August 2024 – December 2024**
- Graded homework for an introductory fluid mechanics course, reviewing concepts like Bernoulli's equation, Reynold's Transport Theorem, the Navier-Stokes equation, Eulerian and Lagrangian equations of motion, and design of experiments

Science Undergraduate Laboratory Intern, Argonne National Laboratory **– Lemont, IL**   **May 2024 – August 2024**
- Increased precision by 82% and run time by 60% on a post-processing python script detecting undesirable behavior in sustainable fuel combustion testing through analysis of pressure transducer data
- Identified the start of compression on Rapid Compression Machine experiments within 0.1ms by fitting experimental pressure curves to models of isentropic compression based on Linear Variable Differential Transformer (LVDT) data
- Compared results from pressure and LVDT datasets to evaluate how to account for noise and piston seating time while detecting asynchronous behavior, improving accuracy by 90%

PROJECTS

6-Axis Robot Arm, *American Society of Mechanical Engineers (ASME)*   **October 2024 – April 2025**
- Led a team of over 40 engineers to design a 2-foot, 6-DOF robotic arm loosely inspired by the Modern Robotics UR3 for presentation at the University of Illinois's Engineering Open House (EOH) event on a budget of $300
- Developed a custom communication system between Python and Arduino to solve memory overflow issues for complex tasks
- Transmitted four distinct PWM signals to simultaneously control 4 stepper motors by manually calculating the output compare register value with different timer frequencies and prescales on clear timer on compare match (CTC) mode
- Implemented a closed-loop PID control system for 2 DC motors to run in tandem with PWM stepper control
- Generated forward and inverse kinematics in Python to generate sets of motor angles from 3D positions and orientations

Robotic Arm Image Replication, *Introduction to Robotics*   **November 2024**
- Created a python script interfacing with ROS to control a 6-axis robotic arm to draw an input image on a piece of paper
- Projected 2D images into 3D coordinates and orientations using contour generation and Douglas-Peucker algorithms

Liquid Rocket Engine, *Liquid Rocketry at Illinois (LRI)*   **September 2024 – February 2025**
- Directed a team of three engineers in the creation of a heat transfer analysis script for the chamber of a rocket engine, using the Bartz correlation, Newton-Raphson, and 4th order Runge-Kutta methods to calculate heat transfer and gas flow properties
- Analyzed stresses on the nozzle retaining ring due to pressure to calculate the minimum retaining ring thickness

Hand-Controlled Drone, *American Society of Mechanical Engineers (ASME)*   **January 2024 – April 2024**
- Designed and manufactured a remote-controlled claw attachment and circuit housing using Fusion 360 and Cura, interfacing directly with the drone body and power supply, and weighing under 50g to reduce impact on battery life
- Created a circuit to wirelessly transmit and receive a PWM signal to a Servo motor for claw actuation up to 20m

Easy-Boiler, *Computer-Aided Design Course*   **August 2023 – December 2023**
- Designed an appliance for convenient food boiling with over 12 interacting parts in Fusion 360
- Conducted customer interviews and market research to identify potential market targets and product ideas, utilizing a Pugh Matrix to narrow design concepts and develop Product Design Specifications

SKILLS

Design: CREO, Siemens NX, Fusion 360, Inventor, Arduino, Cura, DFM, DFA
Analysis & Control: Python, C/C++, ROS, MATLAB, aPriori, Java, Simulink, Ansys Fluent