

# 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: Robotics, Compressible Fluid Dynamics, Design for Manufacturability, Materials, Vibrations, Solid Mechanics*

## EXPERIENCE

**Design Engineering Intern**, Caterpillar, Inc. – Pontiac, IL **May 2025 – Present**

- Designing, manufacturing, testing, and implementing a novel system to return continuous temperature data from fuel injector solenoid wires during engine test cell operation within 1°C to quantify issues with solenoid valve burnout
- Analyzing and reporting on surface quality effects of electrical discharge machining (EDM) on chamfer surfaces to qualify differing effects of various experimental protection methods

**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 4<sup>th</sup> 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
- Characterized the shear stresses for various retaining ring bolt configurations to compare safety factors of different designs

**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, SolidWorks, Siemens NX, Fusion 360, Inventor, Arduino, Cura, JavaScript, DFM, DFA

**Analysis & Control:** Python, C++, ROS, MATLAB, FEA, aPriori, Java, Microsoft Excel