

Alexander (Alex) Smith (he/him)

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Education

Carnegie Mellon University

Pittsburgh, PA

Master of Science in Mechanical Engineering, Advanced Study

Expected Graduation: May 2028

Bachelor of Science in Mechanical Engineering | GPA: 3.90/4.00

Expected Graduation: May 2027

Relevant Experience

General Motors | Design Engineering Intern | Warren, MI

May 2026 - August 2026

- Owned early-stage **Siemens NX CAD** design across 5 performance-vehicle subsystems (exhaust, intake, brake, power unit, suspension), taking concepts from initial geometry through design review.
- Balanced packaging, manufacturability, and cost constraints to improve clearances and reduce mass, part count, and assembly time, while meeting all program requirements and engineering standards.

Carnegie Mellon Racing (FSAE)

Pittsburgh, PA

Powertrain Engineering Captain

April 2026 - Current

- Leading development of **metal additively manufactured uprights**, gearsets, hubs, cooling sleeves, and brakes.
- Creating and optimizing a 2-stage, fixed planetary gearset with a maximum input speed of 20k rpm with **KISSsoft** software.

Steering System Lead Mechanical Engineer

May 2025 - April 2026

- Designed, validated, and manufactured the steering system for a driverless electric FSAE racecar from first principles using **SolidWorks CAD** for modeling and clearance checks, **Ansys FEA** for stress analysis, and **Fusion 360 CAM** for machining.
- Developed and experimentally validated Ackermann geometry and steering effort models, achieving >95% target accuracy and <10% prediction error; partnered with autonomous systems engineers to ensure robust driverless vehicle handling, contributing to a **six-place gain** in autocross performance

Suspension Link Lead Mechanical Engineer

August 2024 - April 2025

- Reduced subsystem mass by nearly 25% through improved **material selection** and **design**, being within 0.05 of FOS targets.
- Created technical drawings with **GD&T** and detailed cost reporting for all suspension subsystems for professional review; all drawings were verified and accepted, and the cost was reduced by 30% as compared to last year.

Carnegie Mellon Combat Robotics | Chassis Design Engineer | Pittsburgh, PA

August 2025 - May 2026

- Designed the chassis for a 30-pound weight class robot, 'Spicy Toucan', to compete in the March 2026 NHRL competition using **SolidWorks CAD** and **Ansys FEA**.
- Engineered a **magnetic clutch system** to activate a 5-pound hammer with a 9-pound flywheel spinning at 200 rpm.

Boeing | Technical Program Management Intern | Seattle, WA

May 2025 - August 2025

- Co-led modifications to **satellite antenna** and Wi-Fi connectivity through design review, evaluating **LEO satellite, antenna**, and in-flight connectivity hardware against system requirements.
- Integrated **engineering data** across aircraft, LEO satellites, and antenna systems into a **single source of truth**, distilling satellite-communications and power architectures for cross-functional and executive stakeholders.

Research Experience

CMU Material Science Department | Additive Manufacturing Research Assistant | Pittsburgh, PA

August 2026 – Present

- Joining the Rollett Group to study process–microstructure–property relationships in metal additive manufacturing.

CMU Mechanical Engineering Department | AI CAD Research Assistant | Pittsburgh, PA

January 2026 – August 2026

- Collaborated with Lockheed-Martin to develop an end-to-end pipeline to turn natural language into fully parameterized and optimized CAD for aerospace components utilizing AI LLMs.

Carnegie Mellon University Robotics Institute | Robotics Research Assistant | Pittsburgh, PA

January 2025 - May 2025

- Designed and validated DFMA-focused mechanical components for an award-winning 2025 Farm Robotics Challenge system, improving manufacturability and field serviceability.

Skills

CAD/CAE: SolidWorks CAD, NX CAD & Motion, Ansys Structural & Fluent, KISSsoft, nTopology, Fusion360 CAD/CAM, MasterCAM, Catia V5, FDM Slicers

Manufacturing: DfM, DfA, GD&T, CNC 3-Axis Mill, CNC Lathe, Manual Mill, Manual Lathe, Manual Tools, FDM 3D Printing

Programming: Python, MATLAB, Java

Societies and Honors

Societies: Carnegie Mellon Racing (FSAE), Robotics Club (Combat Robotics), Pi Tau Sigma, Mortar Board ASME, Club Lacrosse

Honors: Dean's List, INCIGHT Scholar

Certifications: GM: NX CAD, NX Surfaces, Additive Manufacturing, Composites, Metals; Geomiq Academy: 3D GD&T