

Ahmad El-Amin Sidiabed

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EXECUTIVE SUMMARY

Mechanical engineering senior at Virginia Tech with experience spanning aerospace component development, industrial design, and multidisciplinary engineering projects. Background includes fuel-system hardware development at Collins Aerospace, with experience in CAD, computational fluid dynamics, stress analysis, requirements verification, and engineering workflow automation. Experienced in evaluating design deviations and material substitutions by investigating component design and function to assess potential impacts on pressure drop, leakage, and thermal performance. Skilled in concept generation, design sketching, and visual communication, with a portfolio of automotive, consumer product, and robotics concepts exploring form, function, and user experience. Combines creative and analytical problem-solving with attention to detail, technical communication, and cross-functional collaboration. Current projects include electric power steering for Baja SAE and biomedical microrobot concept development. Brings the ability to connect creative design thinking with engineering requirements, translating ideas into clearly communicated concepts and informed design decisions.

SKILLS

CAD & Analysis: Siemens NX, SolidWorks, Siemens STAR-CCM+ (CFD), COMSOL (CFD), Autodesk Fusion 360, GD&T, Tolerance and mass-properties analysis

Design Methods: Requirements verification and traceability, Design reviews, DFM/DFA, QFD, Rapid prototyping, 3D printing

Programming: Python, MATLAB, VBA, C/C++ (Arduino)

Other: Microsoft 365, Adobe Illustrator and Photoshop (Graphic Design certification)

AI Tools: ChatGPT, Claude, Gemini, Copilot

EXPERIENCE

Design Engineer Intern, Main Engine Fuel Control May 2026 - August 2026
Collins Aerospace (RTX) Windsor Locks, CT

- Assessed customer-requested engineering deviations, weighing feasibility, technical risk, and design tradeoffs to support go/no-go decisions.
- Updated internal engineering standards and analysis tools to streamline recurring fuel-control workflows.

Design Engineer Intern, Main Engine Fuel Control June 2025 - August 2025
Collins Aerospace (RTX) Windsor Locks, CT

- Verified valve and actuator designs against General Requirements Documents and maintained requirements traceability across 3+ safety-critical hardware programs.
- Applied mass-properties analysis to quantify a ~10% center-of-gravity difference between two actuator assemblies, informing a design-selection decision.
- Maintained component databases containing material breakdowns and drawing properties for a cross-functional design team.

Design Engineer Co-op, Main Engine Fuel Control January 2024 - August 2024
Collins Aerospace (RTX) Windsor Locks, CT

- Supported flight-critical fuel-system component development through an 8-month design cycle, from initial review through the final design report, using CFD and stress analysis to verify designs against system requirements.
- Built 3 Excel/VBA tools to automate shim selection, snap-ring dimensioning, and pressure-drop analysis, replacing legacy software.
- Established baseline versions of 4 internal tools and compiled cross-program data to standardize documentation for cross-functional teams.

Power Engineering Technologist 1 January 2022 - September 2023
Pike Engineering Roanoke, VA

- Conducted real-time engineering assessments on thousands of utility assets for structural integrity and safety compliance; managed field surveys and CAD deliverables, helping reduce the inspection backlog by ~30%.

PROJECTS

Virginia Tech Baja SAE, R&D Senior Design August 2026 - Present
Power Steering Subteam Member

- Designing and building an electric power steering (EPS) system from scratch for a single-seat off-road competition vehicle, with the goal of improving handling and reducing race times.

Inlet Coarse Filter Design (Collins Aerospace) January 2024 - August 2024
Siemens NX, STAR-CCM+, GD&T

- Designed a precision inline filter in Siemens NX to prevent debris ingestion in a fluid-delivery system while meeting flow and pressure requirements.
- Verified the design against a 15 psid pressure-drop requirement using STAR-CCM+ CFD and performed stress calculations under operating loads.
- Advanced the design through initial and preliminary design reviews and prepared the final technical data package.

O-Wedge Biomedical Microrobot - Nano Robotics Project September 2026 - Present
Virginia Tech | Concept Development in Progress

- Collaborating on an origami-inspired microrobot concept for potential blood-clot removal, exploring compact folding geometry and deployment within blood vessels.
- Proposed concept combines temperature-responsive unfolding with external magnetic guidance to position and manipulate a wedge-shaped structure.

EDUCATION

Virginia Polytechnic Institute and State University (Virginia Tech) Blacksburg, VA
Bachelor of Science in Mechanical Engineering. GPA: 3.15. May 2027

Germanna Community College Fredericksburg, VA
Associate of Science in Engineering, Mechanical Concentration. GPA: 3.45. May 2022