

Alex Popov

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EDUCATION

University of Redlands

3/2 Mechanical Engineering: B.S. Physics and Computer Science, Mathematics Minor

Expected Graduation: April 2026

- Students for the Exploration and Development of Space (SEDS) Redlands Chapter President
- UoR Robotics and Drones President
- UoR Achievement Award Scholarship

EXPERIENCE

SEDS Redlands, Project Lead, President

September 2023 - Present

- Lead CAD designs and systems simulations (SolidWorks, MATLAB) for rover, rocket, and drone development; produced **20+ validated designs**
- Led 4 L1 HPR rocket builds, designed and built custom HPR rockets with real time telemetry, coordinate SEDS L1 HPR Program
- Coordinate 3 cross-functional subteams (mechanical, electrical, software) to deliver integrated designs
- Directed subteams in designing and testing a multi-terrain drone-docking rover, achieving a **50% increase in team output** compared to prior year

UoR Robotics & Drones, President

September 2025 - Present

- Leading development of an AAI RQ7 Shadow inspired UAV with **autonomous flight abilities**, live video, and a custom software dashboard
- Leading research and design of a campus food delivery robot at the University of Redlands

Fedex, Administrative Assistant Internship

June 2024 - August 2024

- Assisted contractor with compliance, training, communicating with drivers, applicant screenings, maintenance reports
- Addressed customer inquiries, documented incidents, and completed business reports

So-Cal Heating & Air, HVAC Technician

June 2021 - August 2022

- Assisted licensed techs on residential installs and service calls (mini split systems, heat pumps, furnaces, condensers, air handlers)
- Diagnosed common faults (capacitors, contactors, relays, transformers, blower motors) and replaced parts

SKILLS

Languages: C++, Python, JS, SQL, Java, HTML, CSS, MATLAB

Simulation Tools: MATLAB, ANSYS, CFD

Data: Pandas, Numpy, MongoDB, Rest API, Matplotlib, Rviz, Jupyter Notebook

Communication Systems: RF telemetry, LoRa, mesh networking, secure data links

AI/ML: Pytorch, Tensorflow, scikit-learn, NLP, computer vision training, LLM WebApp Integration techniques

Edge AI Platforms: Nvidia Jetson, Google Coral, Raspberry Pi

GIS Tools: ArcGIS, ArcGIS StoryMaps, GeoPandas

Lab Equipment: Multimeters, circuit design, soldering, oscilloscopes

Robotics Systems: microcontrollers, R/C, FPV, sensors, RF, motors

Operating Systems: Linux, Windows

Version Control: Git, Github, Jupyter

Quadcopter FPV Drones: designing, programming, troubleshooting

Sensor Fusion: IMU, barometer, ultrasonic, GPS, real-time telemetry and logging

Leadership: teams in mechanics, electronics, software, and finance

Mechanical/Part Design: Solidworks, AutoCAD, Onshape

Other: Visual Studio Code, CNC software, AWS, 3D printing, engineering drawings, technical documentation, engineering principles, Revit, Forge, Adobe, budget planning, material science, MS Excel, Microsoft Office, applied physics

PCB Design: schematic capture, board layout (Altium Designer)

Flight Control Systems: PID tuning, control loop design, ROS

PROJECTS

Autonomous Rover ArcGIS Mapping System (SEDS) | ArcGIS, LiDar, ROS, Python, OpenCV, Sensor Fusion, IMU/GPS RF Modules

- Deployed a custom rover equipped with LiDar, camera, IMU, GPS, and onboard compute to autonomously traverse campus buildings and collect high-resolution spatial and sensor data
- Processed rover telemetry and LiDar point clouds in Python and imported the cleaned datasets into ArcGIS to generate detailed interior and exterior maps of University of Redlands buildings, supporting research and facilities planning

Drone Docking Rover (SEDS) | Solidworks, MATLAB, C++, Python, ROS, Nvidia Jetson, Raspberry Pi, ESP32, Sensor Fusion, Pytorch, Tensorflow

- Designed rover chassis, frame, drone landing attachment, and camera module in SolidWorks to remotely deploy and recover drones
- Collaborated with subteams to integrate a laser-equipped **custom robotic two axis camera module** with object recognition
- Implemented **long range telemetry** (LoRa) for remote operation and remote video transmission

Autonomous Campus Food Delivery Robot (UoR R&D) | LiDar, Computer Vision, ROS, Nvidia Jetson, Python, C++, Sensor Fusion, GPS

- Leading development of ground robot capable of campus food delivery with a secure QR-code based access system
- Researching implementation of lidar, computer vision, and sensor fusion pipelines in ROS

Custom Fiberglass Rockets (SEDS) | Solidworks, MATLAB, Avionics Integration, Composite Materials, OpenRocket, C++, Jupyter, PCB Design

- Designed and assembled L1 HPR rockets for student launches, integrating sensors, telemetry, and custom software dashboards
- Performed **stability margin calculations** and **thrust-to-weight optimization** on rocket builds
- Designed rocket airframes and propulsion systems in SolidWorks and validated flight performances using MATLAB and OpenRocket

AAI RQ7 Shadow UAV | Solidworks, MATLAB, ROS, Nvidia Jetson, GPS, Autonomous Flight, Telemetry, Python, C++, PCB Design (Altium)

- Developing mechanical and electrical subsystems including airframe CAD modeling, propulsion integration, and embedded control software
- Leading development of flight control and communication systems implementing autonomous navigation, GPS, and ground-station telemetry

Autonomous Drone (SEDS) | PX4 Autopilot, ROS, Pixhawk, Python, C++, LiDar, Nvidia Jetson, Ultrasonic Sensors, IMU/GPS, Sensor Fusion, OpenCV

- Designed a **quadcopter drone** to return to the rover landing pad using an Nvidia Jetson, flight controller, ROS, camera, and LiDar
- Streamed flight telemetry and sensor data to a **Python-based ground station dashboard** for real-time monitoring and post-flight analysis