

Alex Popov

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EDUCATION

Columbia University

B.S. Electrical Engineering

Expected Graduation: May 2028

University of Redlands

B.A. Physics, B.A. Computer Science

August 2023 - April 2026

- Awards: David J. Miller Physics Award, UoR Achievement Award Scholarship

WORK EXPERIENCE

Columbia University, Photothermal Desorption Undergraduate Researcher

September 2026 - Present

- Designing and fabricating a 2.5 m vertical microwave reactor that desorbs CO₂ from zeolite sorbent
- Designing a cascade gate mechanism: actuators slide seven stacked gates open bottom-to-top so sorbent free-falls as a thin curtain through the cavity, setting dwell time per stage and eliminating the conveyor of the prior horizontal design

Glenair Inc., RF Engineering Intern

June 2026 - August 2026

- Designed and validated a 10.25 GHz microwave cavity resonator using Solidworks, ANSYS HFSS, and VNA measurements to characterize dielectric materials
- Developed a Python FFT and anomaly-detection system to identify periodic manufacturing defects based on RF and high-speed cable diameter data
- Designed and validated a prototype tactical antenna pass/fail device for 902-928 MHz antennas
- Collaborated with the RF engineering team to develop, fabricate, test, and electrically validate high-speed SATA and Ethernet cable assemblies
- Produced engineering drawings, bills of materials, and manufacturing instructions for RF and high-speed cables

FedEx, Administrative Assistant Intern

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 2023

- Assisted licensed technicians 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

Embedded Systems: Hardware-software integration, microcontroller programming, sensor interfacing, robotics, Arduino, ESP32, STM32, Raspberry Pi, I2C, SPI, UART, motor control

Electronics: Circuit and PCB design, Altium Designer, KiCad, protoboard/breadboard prototyping, power regulation and distribution

Lab & Test Equipment: Oscilloscopes, digital multimeters, bench power supplies, function generators, soldering, rework

RF Systems: Antennas, RF telemetry, S-parameters, impedance matching, return loss, VSWR, vector network analyzers (VNAs)

Mechanical Design: Solidworks, mechanical prototyping, 3D printing, engineering drawings

Programming & Simulation: Python, C, C++, MATLAB, ANSYS HFSS, Java, Git, Linux, Web-app development, VS Code

ENGINEERING LEADERSHIP & ACTIVITIES

Columbia Space Initiative - Columbia University

August 2026 - Present

- Designing the satellite communication PCB for LIONESS, a 6U scientific CubeSat scheduled for flight-hardware handoff in late 2027
- Selecting and testing components for the onboard computer and power distribution

UoR Robotics & Drones - University of Redlands, President

September 2025 - April 2026

- Led development of a GPS-enabled FPV quadcopter integrating digital video transmission
- Designed gesture recognition car using LiDAR and computer vision, with Raspberry Pi/ROS 2 navigation and ESP32 motor control

SEDS Redlands Rocketry - University of Redlands, President

February 2024 - April 2026

- Led electrical design, mechanical design, and system simulation for student rover
- Organized rocket workshop focused on building and launching rocket kits

PERSONAL PROJECTS

Microwave Doppler Velocity Measurement System (Physics Capstone)

February 2026 - April 2026

- Developed a non-contact system to measure the instantaneous velocity of a crank-slider mechanism at specified crank angles using microwave Doppler shift
- Designed an op-amp signal-conditioning circuit and ESP32 data-acquisition system to capture the sensor's intermediate-frequency output, calculate velocity, and log measurements

Radar Guided Electro-Optical Tracking System

September 2026 - Present

- Developing a rotating radar sensing system to detect moving objects, estimate target direction, and automatically cue a pan-tilt camera for computer-vision tracking
- Designing a motor-control PCB for radar rotation and camera pan-tilt actuation, integrating motor drivers, power regulation, and microcontroller-based control

Solar GPU Cluster

April 2023 - August 2024

- Installed solar panels and inverters to power a GPU compute cluster supporting cryptocurrency mining and cloud-based AI model training on Vast.ai
- Built and configured custom multi-GPU systems using NVIDIA RTX GPUs and supporting hardware
- Developed an automated control system to run compute workloads during active solar generation, minimizing grid power consumption