

Rana Taki

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EDUCATION

Stanford University

Stanford, CA

B.S. in Mechanical Engineering and Computer Science

June 2026

Coursework: Computational Engineering (FEniCS), Heat Transfer, Failure Analysis, Decision-Making Under Uncertainty, Operating Systems Principles, Machine Learning, Spacecraft Design, Probability for CS

EXPERIENCE

Research Assistant — Stanford Intelligent Systems Laboratory

Stanford, CA

Autonomy, retrieval systems, mechanical design

2025 – Present

- Developed a safety-grounded RAG pipeline with OCR, layout parsing, and structure-aware chunking for aviation POH data, achieving 0.13 ms FAISS retrieval across 178 docstrings.
- Evaluated embedding models (OpenAI text-embedding-3, bge-large, e5-large), improving precision@K by 15–20% while reducing inference latency.
- Manufactured CNC-machined replacement components for a 6-DOF motion platform with geometric tolerancing, precision metrology, and structural QA.
- Performed Python-based FEM stress and deformation analysis with ParaView visualization to validate reliability.

Lead Developer — Avia (AI Voice Copilot)

Stanford, CA

Real-time avionics reasoning and voice autonomy

2025 – Present

- Architected an edge autonomy stack on NVIDIA Jetson (Ollama-8B + cloud GPT) enabling real-time intent parsing and decision support under constrained compute.
- Designed a speech-to-decision safety pipeline achieving 99% accuracy and <10 s end-to-end latency for emergency workflows.
- Led 100+ pilot-in-the-loop evaluations with certified instructors to refine iOS aviation UI and speech safety requirements.

Software Engineering Intern — Refik Anadol Studio

Los Angeles, CA

Large-scale ingestion, dataset processing

2023

- Developed secure, high-throughput ingestion pipelines for 200M+ images using automated session rotation and dataset QA.
- Built a Scrapy + MySQL image classification framework with geographic and species tagging enabling fast retrieval.

PROJECTS

Stanford Flight Club — Structures and Avionics

Stanford, CA

Mechanical design and composite optimization

2025 – Present

- Designed avionics mounting floor in Fusion 360, reducing fuselage volume by 2 inches with zero weight increase.
- Built MATLAB composite-tube optimization to maximize stiffness-to-weight performance for mission operations.

TECHNICAL SKILLS

Software: Python, C/C++, MATLAB, JavaScript, Swift, SQL, Linux, Git

Autonomy & Robotics: NVIDIA Jetson, ROS, embedded Linux, telemetry, real-time systems, computer vision, FAISS, RAG pipelines

Simulation & Modeling: FEM (FEniCS workflows), ParaView, MATLAB, stress/deflection modeling

CAD & Fabrication: Fusion 360, CNC machining, milling, drilling, 3D printing, GD&T, composite layouts

AI/ML: OCR, embedding models (OpenAI, bge, e5), layout parsing, perception pipelines