ROHAN KATREDDY

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EDUCATION

University of Waterloo   Waterloo, ON
Bachelor of Computer Science
- GPA 3.9; Waterloo Rocketry, Waterloo Aerial Robotics, Watonomous

TECHNICAL SKILLS

Languages: Python, C/C++, SQL, TypeScript, HTML/CSS
Libraries: React, OpenCV, NumPy, Matplotlib, YOLO
Embedded/Robotics: ArduPilot, MAVLink, STM32CubeIDE, Arduino

EXPERIENCE

Solcoa   San Francisco, CA
Software Engineer Intern   *May 2025 – Aug 2025*
- Built linear-regression forecaster to predict temp., pressure, & O_2 changes over experiment with **91.3%** accuracy
- Engineered data pipeline using ESP-32s, Postgres, and Grafana to monitor reactors, logging **50,000+** points/day
- Implemented thermo-chem model to validate and optimize parameters using gradient descent for rare-earth refinement processes resulting in **37%** yield quality improvement per experiment

Waterloo Aerial Robotics Group   Waterloo, ON
Fixed-Wing Aircraft Manager   *Mar 2025 – Present*
- Leading the Eclipse program managing a **8 person** cross-subteam to design and build a custom fixed-wing aircraft
- Engineered four modular fixed-wing test aircraft used for parallel testing, upping team wide iteration speed by **4x**
- Built an OpenCV IR-beacon detection + geotagging pipeline; global-shutter capture and GPS/IMU sync delivered **95%** detection accuracy and **<0.5m** geo-tag RMSE on fast moving drones

Watonomous   Waterloo, ON
F1Tenth Autonomy Engineer   *Sep 2024 – May 2025*
- Built a standalone 1:10 scale race-car capable of autonomous racing at **12 m/s** for the F1Tenth competition
- Worked on **40 Hz** LiDAR-based **SLAM** with for real-time localisation and mapping during races
- Utilized Foxglove for autonomy software validation, cutting iteration cycle time by **50%**

PROJECTS

Neural Network from Scratch
- Built a handwritten-digit classifier using feed-forward neural networks achieving **97 % accuracy**
- Implemented back-propagation, gradient descent, and sigmoid activation from first principles with NumPy

Hyperic – Autonomous Plane & Drone
- Built autonomous security drones with multi-subject tracking, and **95% accurate** suspicious activity detection
- Increased usable security footage by **5x** vs static CCTVs through LLM-powered ground station
- Engineered a docking station with **100% success rate** autonomous landing using GPS, IR beacons, and AprilTag

Autonomous Car
- Improved heading accuracy by **38×** through in-house hard/soft-iron compass calibration and tilt-compensation
- Built a modular autopilot using STM32s, Ublox GPS, MPU9250 IMU, and NRF24L01+ telemetry components
- Used Canny + Hough with a triangular ROI and slope filtering; averaged segments to detect and follow lanes
- Implemented EKF for state estimation, then closed loop with PID controllers, achieving **0.26m RMSE** at 4.2m/s

4-bit CPU with 1000+ Transistors
- Built **4-bit** computer with ring counter, 4-bit ALU, 10-byte memory, and a unified bus using **1000+ NPN BJTs**
- Constructed an astable-multivibrator system clock with debounced single-step mode; measured **0.6Hz**, upto **2Khz**.