Rohan Khatri

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Education

Texas Tech University (Honors College) Lubbock, TX

B.S. Electrical Engineering & Physics, GPA: 3.9/4.0 *Incoming Junior, Expected Fall 2027*

- Relevant Coursework: Circuit Analysis, Electronics, Signals & Systems, EM Fields, Digital Systems, Embedded Systems, Differential Equations, Probability & Statistics

Experience

Hardware Research Engineer (Undergraduate) March 2025 – August 2025

Texas Tech Honors College (Funded Research) *Lubbock, TX*

- Developed a real-time embedded voice AI system on ESP32 with dual-core FreeRTOS, handling 24kHz audio capture and playback across a 78×700-sample circular buffer.
- Designed and hand-soldered a custom PCB with tiny ESP32 SoC, power management ICs, and audio frontend for low-latency audio streaming.
- Implemented AWS cloud backend using Dockerized Python, WebSocket integration with OpenAI Realtime API, and TCP/UDP streaming for bidirectional audio (<500ms perceived latency).
- Built a companion React Native mobile app with real-time device communication, calendar/email integration, and audio streaming control
- Won social entrepreneurship challenge for assistive technology application with a cash prize

Undergraduate Research Assistant – UAV Systems October 2025 – Present

Texas Tech University *Lubbock, TX*

- Assisting in development of a hexacopter platform for GPR-based UXO detection in Ukrainian conflict zones
- Perform flight testing and Pixhawk autopilot configuration using MAVLink telemetry and QGroundControl
- Designed structural components and sensor mounting systems in Fusion 360; fabricated parts via 3D printing
- Conduct PID tuning and flight log analysis to diagnose control issues and optimize autonomous flight stability

Technical Projects

Gravity-Based Height Measurement Device

Arduino Mechatronics Project

- Measured height using free-fall kinematics with laser-photodiode timing

Autonomous Line-Following Rover

MSP430 Embedded System

- Programmed MSP430 in register-level C for PWM motor control and sensor interfacing
- Implemented IR line tracking and ultrasonic obstacle detection with interrupt-driven logic

DTMF Tone Decoder

Digital Signal Processing

- Implemented FFT-based dual-tone detection and frequency classification in Python with 95% accuracy

Published Mobile Applications

Software Engineering

- Developed and published 4 Android applications including a cloud-based real-time scheduling system for TTU with 150+ test users

Technical Skills

Embedded Systems: C, C++, Object-Oriented Programming (OOP), Python, Matlab, FreeRTOS, Register-Level C, LTSpice
Hardware: PCB Design, PCBA, ESP32/MSP430, Signal Conditioning, Lab Equipment
Control: PID Tuning, MAVLink, Pixhawk/QGroundControl, Sensor Integration
Tools: Autodesk Fusion 360, KiCad, 3D Printing, CNC workflows, AWS IoT, Docker, Git