Shantanu

ECE Undergraduate | Embedded Systems Engineer (ESP32, Sensors, IoT)
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Linkedin | **Portfolio** | **GitHub**

Education

- **Thapar Institute of Engineering and Technology** — Patiala, Punjab
  Bachelor of Technology - Electronics and Communication Engineering — **August 2025 - Present**
- **Thapar Institute of Engineering and Technology** — Patiala, Punjab
  Minor Degree - Computer Science and Engineering — **August 2026 - December 2027**

Skills Summary

- **Embedded Systems**: ESP32, Arduino, I2C, UART, SPI, MQTT, Real-time Processing
- **Programming**: C, C++ (Arduino), Python, JavaScript
- **Hardware / Electronics**: Sensors, Electromagnets, Power Electronics, GPS Modules, OLED Displays
- **Tools / Platforms**: Git, GitHub, KiCad, Arduino IDE, ESP-IDF, Vercel

Projects / Open-Source

- **Adafruit CircuitPython - Wi-Fi API** — **C, CircuitPython**
  Open-source contribution in C: Developed Raspberry Pi support for `wifi.radio.ap_info`; approach carried into the merged upstream update. Initial PR #11625.
- **Zephyr-Station** — **ESP32, C++**
  Built an ESP32 environmental monitor with I2C sensors, OLED visualization, SD-card logging, and threshold alerts.
- **Jolt-Locator** — **ESP32, C++**
  Built an ESP32 GPS-based true-north navigator with real-time heading computation and UART location processing.
- **The-Ruin-Machine** — **ESP32, C++**
  Built a stochastic simulator on ESP32 with OLED display and buzzer I/O.
- **Geometrical Shape Detection | Report** — **Python, OpenCV**
  Developed 6 OpenCV/NumPy algorithms for automated geometric-shape detection and recognition.

Experience

- **Ragastra MV Lev** — Patiala, Punjab
  Hardware & Controls Engineer — **September 2025 - Present**
  - **Electromagnetic System Design**: Designed and tuned custom electromagnets for magnetic levitation prototype with optimized coil parameters.
  - **Power Electronics**: Designed and debugged SMPS-based power circuitry for inductive electromagnetic loads.
  - **Motor Control Systems**: Implemented Arduino-based synchronized dual stepper motor control with real-time actuation.
- **Grosity** — Patiala, Punjab
  Early-Stage Founding Engineer — **October 2025 - February 2026**
  - **Web Development**: Developed and deployed company website using AI-assisted development workflows (Claude, GitHub Copilot, Kiro IDE).
  - **Autonomous Systems R&D**: Contributed to embedded electronics and control logic for autonomous payload-delivery drone systems.
  - **Product Strategy**: Aligned engineering decisions with B2B and D2C product models and business strategy.

Ongoing Research

- **GHFCVs - Reverse Engineering Study** — **December 2025 - Present**
  Literature review and comparative analysis of DC-DC converter topologies with hands-on teardown of commercial GHFCV systems to understand power electronics architecture and operational principles.

Certifications & Achievements

- **Internet of Things** - MIT Professional Education x Santander Open Academy
- **Google: Artificial Intelligence and Productivity** - Google x Santander Open Academy
- **National Finalist** - E Summit Ideastorm 2026, IIT Roorkee