SHLOK KUMAR

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🎓 EDUCATION

Bachelor of Technology in Electrical and Electronics Engineering
Galgotias college of engineering and Technology, India
Expected Graduation: 2028
CGPA: *unknown till now*

🔧 TECHNICAL SKILLS

Programming Languages

- C (Standard, Embedded)

- Python (automation & simulations)

Microcontrollers & Boards

- 8051 Microcontroller (Timers, Interrupts, ADC, 7-seg, LCD, Keypad, GSM optional module)

- STM32 (Bare-Metal) – GPIO, Timers, NVIC, ADC (LM35, Potentiometer), I²C LCD, Interrupts

- Arduino & ESP32 – Sensors, communication protocols, PWM, ADC, serial debugging

Embedded Systems Skills

- Embedded C (Modular drivers, ISR development, peripheral configuration)

- Timer programming (Mode 1, Mode 2, STM32 Advanced timers)

- Interrupt-driven design (external, timer, ADC interrupts)

- Sensor interfacing: IR, ultrasonic (HC-SR04), LDR, LM35, SHARP IR, hall sensors

- Display interfacing: 7-segment (single & multiplex), LCD 16×2 (CGRAM, scanning, dynamic text), I2C displays

- Motor & Actuator control: Servo (PWM), DC motor (PWM + drivers), relay-based switching

Communication Protocols

- UART, I²C (basic + advanced LCD integration), SPI (learning phase)

- Serial debugging and data visualization

Simulation & Modeling Tools

- Proteus 8 (extensive circuit simulation)

- MATLAB & Simulink (Onramp level + system modelling, ongoing)

Development Environments

- Keil μVision

- VS Code

- Arduino IDE

- STM32CubeIDE (for debugging & register-level understanding)

Additional Skills

- Project planning & documentation

- Technical writing

- Basic PCB workflow

- Photo/video editing for project presentations

💡 PROJECTS & MINI PROJECTS

1. Traffic Light Control System – 8051

- Implemented complete traffic logic using timer interrupts & pedestrian logic

- Included buzzer, LED signaling, delay modes

- Tools: Keil, Proteus

2. Border Intrusion Alert System (7-Segment + IR + Buzzer)

- IR detection module with LED + buzzer alert

- Integrated 7-segment counter using interrupts

- Tools: Keil, Proteus

3. Rural Grid+ (REM-ADS) – Renewable Microgrid Monitoring System

- MCU-based offline IoT system for rural microgrid monitoring
- Battery SOC, panel efficiency, current sensing logic
- Selective load disconnection based on overload interrupts
- LCD-based live metrics + GSM alert logic (optional)
- Skills used: ADC multiplexing, interrupt-based current detection, embedded C architecture

4. FluxCharge Vision – Relay + IR Sensor Integration

- Real-time switching logic based on IR detection
- Relay driving for TX power control
- Debounce + stability testing

5. 360° Radar Scanner using Ultrasonic Sensor (HC-SR04 + Servo)

- Motor-based rotation of ultrasonic sensor
- Data acquisition for mapping + CSV export
- PWM-based servo control
- Tools: Arduino, processing

6. STM32 Mini Tasks (Phase 1–3 Completed)

- GPIO input/output with register-level access
- Timer configuration, advanced delay generation
- ADC with LM35 & potentiometer
- I^2C-based LCD driver communication
- Interrupt-based sensor reading
- Preparing for UART, SPI, advanced I^2C

🎯 TARGET INTERNSHIPS

- Winter Internship – DRDO, Jan 2026

- Target Domains:
    - Embedded Systems
    - Microcontroller development
    - MATLAB/Simulink models
    - Signal processing applications
    - Smart grid / renewable monitoring applications

📃 CERTIFICATIONS (Planned & In Progress)

- MATLAB Onramp – Aug 2025
- Simulink Onramp – Aug 2025
- Embedded C & System Design (Self-paced)
- STM32 Bare-Metal Foundations (Ongoing – self-structured roadmap)

🗎 ACADEMIC INTERESTS

- Control Systems
- Embedded Programming & Real-Time Systems
- Signal Processing
- Renewable Energy & Power Electronics (project-related interest)

👥 LANGUAGES

- English – Professional Proficiency
- Hindi – Native