# ESP32-driven multi-protocol gateway for Interoperable IoT Devices

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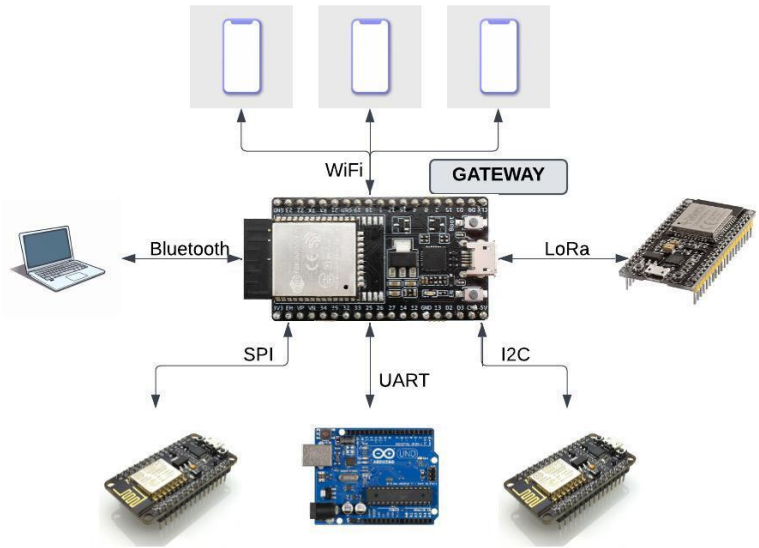
**Abstract**

The project aims at facilitating seamless communication between IoT devices each using varying wireless protocols. The gateway integrates Wi-Fi, Bluetooth, I2C, SPI, LoRa, and UART, enabling interoperability across heterogeneous devices in an IoT network. By leveraging the powerful features of the ESP32 microcontroller, the gateway allows efficient data transmission, protocol translation, and dynamic switching between communication technologies. The proposed system is designed to address the challenges of device connectivity and data routing in modern IoT applications, ensuring flexibility and scalability.

**Proposed Methodology**

- Requirement Analysis
- Hardware Integration
- Software Development
- Protocol Translation
- Testing & Validation
- Mobile App Integration
- Performance Optimization




**Hardware Components**

- ESP32
- ESP8266
- Arduino
- LoRa module
- Power Source

**Software Tools**

- Arduino IDE
- Communication libraries (e.g., LoRa, SPI, UART, I2C, WiFi, Bluetooth)
- Mobile IOT App (e.g., Blynk)