Smart Home Monitoring

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Design and implement a comprehensive Smart Home Monitoring and Security System utilizing Raspberry Pi, Sense HAT, camera, simulated sensors, an MQTT broker, a database, and WhatsApp integration. This system aims to provide real-time monitoring of environmental conditions and security while allowing users to request updates and receive pictures through WhatsApp.

Tools, Technologies, and Equipment

- Raspberry Pi 3B+:
  - Central control unit for data collection, processing, and communication.
- Sense HAT:
  - Measure temperature, humidity, pressure, and orientation for environmental monitoring.
- Camera:
  - Provide visual monitoring and security through motion detection.
- Simulated Sensors:
  - Simulate additional sensors (motion, light, gas) to enhance the monitoring capabilities.
- MQTT Broker:
  - Enable efficient communication between devices for real-time updates.
  - Publish data to the MQTT broker for real-time updates.
- Database:
  - Store historical data for analysis and visualization on a web-based dashboard.
- WhatsApp / Email Integration:
  - Set up email and WhatsApp alerts for security breaches and abnormal conditions.
  - Implement integration with the WhatsApp Business API for sending updates and pictures.
  - Implement the ability to respond to specific WhatsApp commands (e.g., "update" to request sensor updates, "picture" to receive camera snapshots).
- Python Scripting:
  - Develop Python scripts to read data from sensors, camera, and simulated sensors.
- User Interface (Depends on time):

- Create a web-based dashboard for users to monitor real-time and historical data.
- Display camera snapshots, sensor readings, and energy consumption patterns.

Project Repository

Github Repo