Project: Cerberus

IOT Based Raspberry Pi Home Security System

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1. Repository

The project history, schematics, diagrams and codebase are contained under the following git repository:
https://github.com/Marius2m/Project-Cerberus

2. User Requirements

1. The system must provide information regarding a detected movement.
2. The system should be open for extension (eg. adding more sensors or cameras).
3. The system should be available 24/7
4. The system must provide acccess to history data for the last 3 weeks.

3. System overview

Activator - Google Assistent/Amazon Alexa based subsystem that activates or deactivates the alarm system

Monitoring subsystem - consists of the camera module and sensors for motion detection that are turning on the camera module

Email subsystem - whenever motion is detected and the camera is on an email is sent to the owner with an attachment of an image containing the intruder that was captured by the motion sensor

Cloud Storage - stores pictures that were captured when motion sensors detected movement

4. Circuit design

The components used are:

- Raspberry Pi 3B+
- Arduino Nano
- Pi Camera
- PIR Sensor
- Microphone
- Speakers
- LED
- Bread Board
- Resistor (1k)
- Connecting wires
- Power supply

We are using Raspberry Pi 3B+ as it includes a Wi Fi and Bluetooth module.

The Arduino Nano is used for reading data continuously (PIR Sensor) and when it detects movement (motion) it send data via the nRF24L01 Transceiver Module to the Raspberry. The Raspberry reads the data received via the same module.

The Pi Camera Module comes in handy as it is easy to use and it will capture photos whenever motion is detected.

The PIR sensor is attached to the Arduino Nano and when motion is detected the Raspberry is notified.

The microphone and speakers are used for the Google Assistant/Amazon Alexa. It will include two commands for turning the system on and off.

5. Software design

6. Results and further work