



HomeSecuriPi

A cheap security system for your house

Final Presentation



Authors:

Matteo Guerrini
Giacomo Menchi
William Paciaroni

Instructor:

J.T. Foley

Introduction

- **Problem:** Detect strange movements and/or sounds inside a house or building
- **Why people care:** People want to feel their home is protected
- **Requirements:**
 - Cheap
 - Reliable
 - Easy to blend
- **Who wants it:** Anyone who is owner of a house or building and would like to improve its security in a cheap way

Related Works

Canary Camera: One of other solutions on the market.
Its cost is of \$99.00.

PROs

- Weather condition monitoring
- Real time camera
- Past recordings

CONs

- No movements detection
- No alarm notification
- High price for what it offers



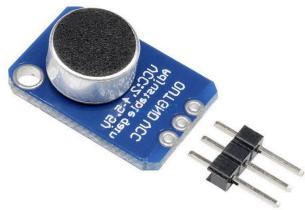
Hardware



Starter Pack(RPi-Camera-SupplyPower): \$29.66



PIR Sensor: \$0.73



MIC: \$0.96



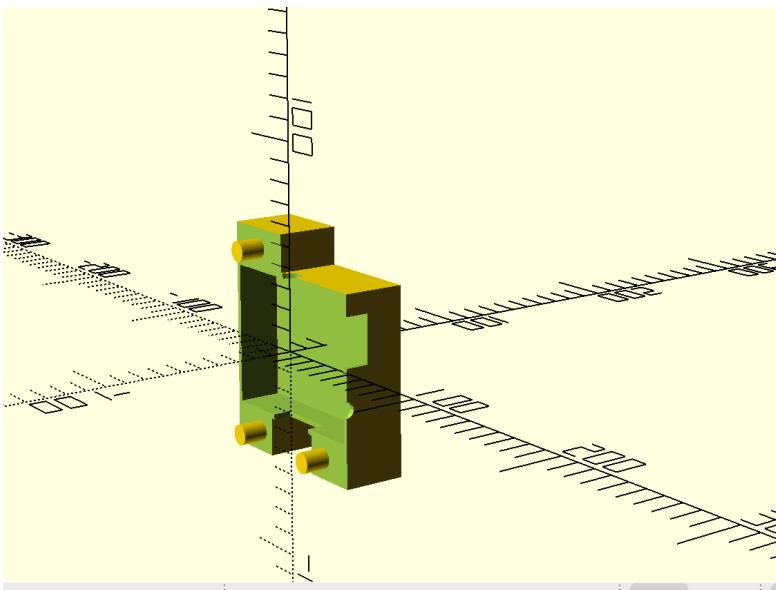
Speaker: \$3.44

Total: \$34.79

Software

- **Core:** it is the heart of the program. It manages the TelegramBot. It enables/disables other scripts and controls speaker
- **Camera:** it detects human movements and communicates to the Core
- **Mic:** it detects loud noises, e.g. window shattering, and communicates to the Core
- **PIR:** it detects presences and communicates to the Core

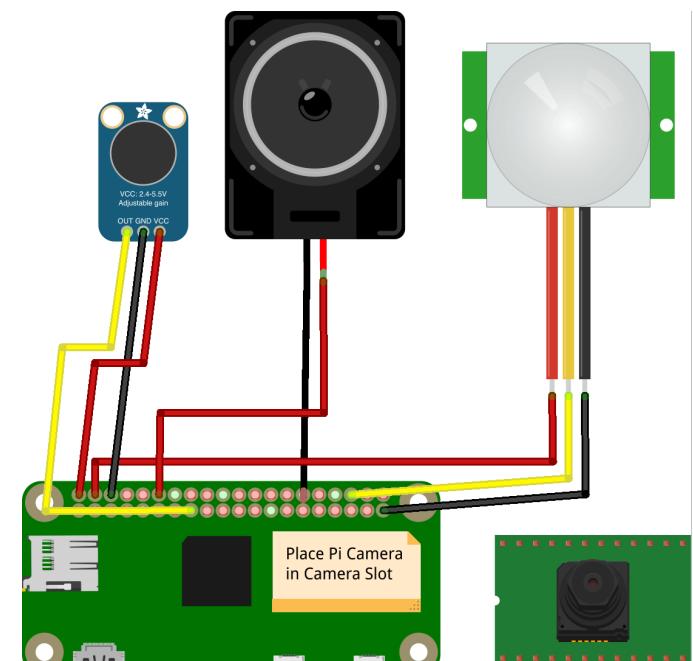
Model



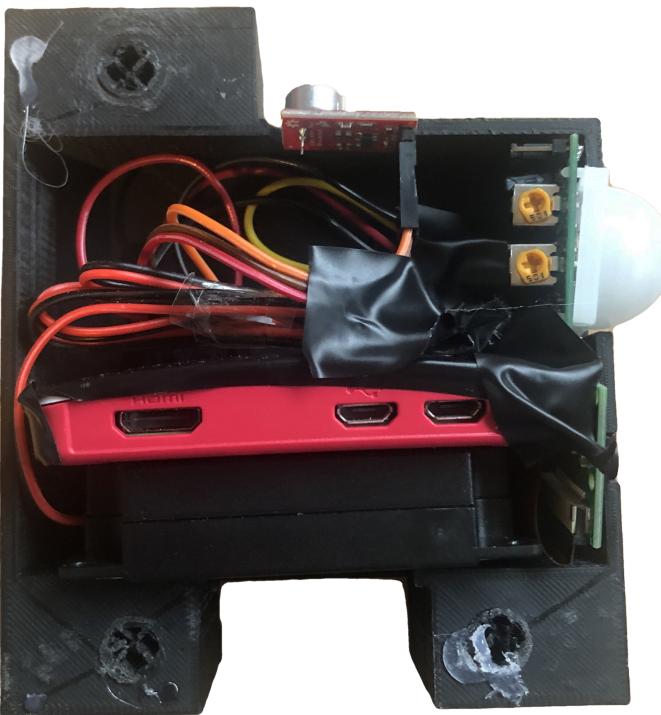
Model: The model on the left is built using OpenSCAD and it is divided in two different parts. Code is available on GitHub.

The picture on the right, instead, is the schematic of the circuit.

Those could be useful to anyone who wants to replicate or improve our project.



Design





Current Capabilities



- Movement detection up to 50 meters, with no false positives
- Sound detection over a certain threshold (58dB)
- Scar off burglars using the integrated speaker
- Notification via TelegramBot to a single person or a group
- Dark design so that it blends with the environment, specially at night

Future Extensions

- Use a more powerful RPi to have a more stable system with higher performance
- Have a dedicated App to control it instead using the TelegramBot
- Integrate with Amazon Alexa or similar
- Live Video using the dedicated App
- Capture photo on movement detection
- Light sensor to check if lights are on

Conclusion

The bottom line is that we achieved a working home security system which detects movements and sounds, and communicates adequately with the user to signal them when something happens.

The project is intended to be a prototype created in a short amount of time, and thus may present some flaws or other issues.

Nonetheless, we would like to thanks Reykjavik University which has given us the instruments and the possibility to develop this cool and useful project, in addition to the support during the development itself.



DEMO



Thank you for your attention!

And now a little demo of our project.