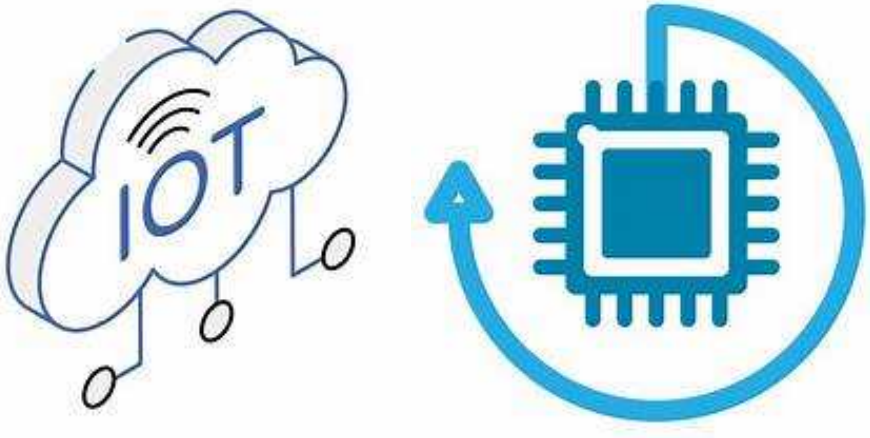
한국외국어대학교
HANKUK UNIVERSITY OF FOREIGN STUDIES

Internet of Things (IoT) Systems



Topics for Term Projects in Internet of things

Ikram Syed, Ph.D.
Associate Professor
Department of Information and Communication Engineering
Hankuk University of Foreign Studies (HUFS)

Spring – 2025

Suggested ideas in Internet of things

Term Projects for IoT

Important dates (1/2)

- April 15, 2024: Topic Title selection
  - Send an email about your Term project topic title.
  - This Title will not be changed!

- April 29, 2024: Show first draft of your Term Project
  - In Five minutes: show it during the lecture and discuss your current progress.
  - Show your next stages and plan.

- May 20, 2024: Show second draft of your Term Project
  - In Five minutes: show it during the lecture and discuss your current progress.
  - Show your next stages and plan.

Important dates (2/2)

- June 03 & 10, 2024: Final submission and PPT presentation.
  - Prepare a pdf file summarizes all the Project details (no less than 10 pages).
  - Show that the Project works correctly.
  - Prepare a PPT and present for 20 minutes including Q&A.
  - Make a short Demo (video) of your project.
  - Put the **Demo + summary pdf + PPT** in one folder, zip them, and submit in the day of the submission.
  - File name: IoTsystem_YourName_StudentID_TermProject.rar
  - Email Title: [IoTsystem_YourName_StudentID_TermProject]

Important rules (1/3)

- The assignment will be graded out of 30 marks.
- Late submissions after the announced dates will lose marks.
- Final submission after the due date will not be considered!
- Each student should select a unique Term project based on his interest.
- The hardware project should be work successfully!

Important rules (2/3)

- You should be fully understanding the project!
- Summary them into at least 10 pages of pdf file.
- Make a PPT presentation (in English) of your summary of NO less than 20 slides.
- Final presentation should be (in English) and in 20 minutes at least including Q&A.
- Each student should answer questions asked by the audience.

Important rules (3/3)

Summary and the PPT presentation should contain the following:

1. The basic idea of each Term Project.
2. Describing the system design and method of Term Project.
3. Explaining the hardware and software details.
4. Highlighting the most meaningful benefits and findings .
5. Future directions: the next expected extension works of the Term Project.

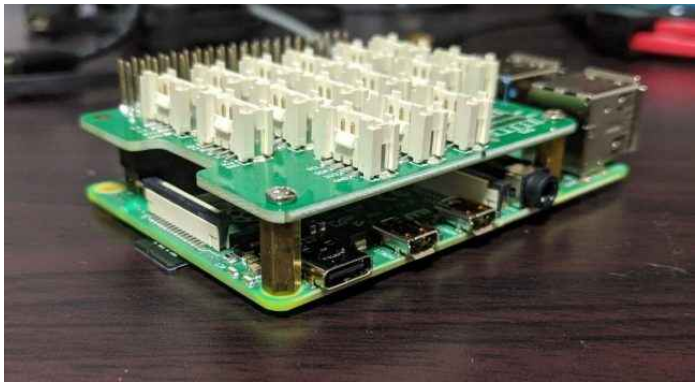
Suggested Term Projects ideas in Internet of things

1- Smart Agriculture System

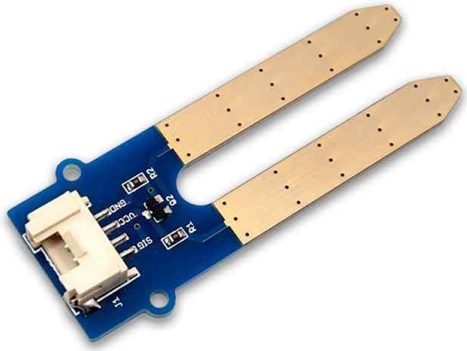
Idea:

- Everyone has or use to have one plant in their home.
- We can be easy to forget to water them.
- However, this smart plant alert project, which uses a Raspberry Pi computer to send her tweets whenever it's time to water her plant!

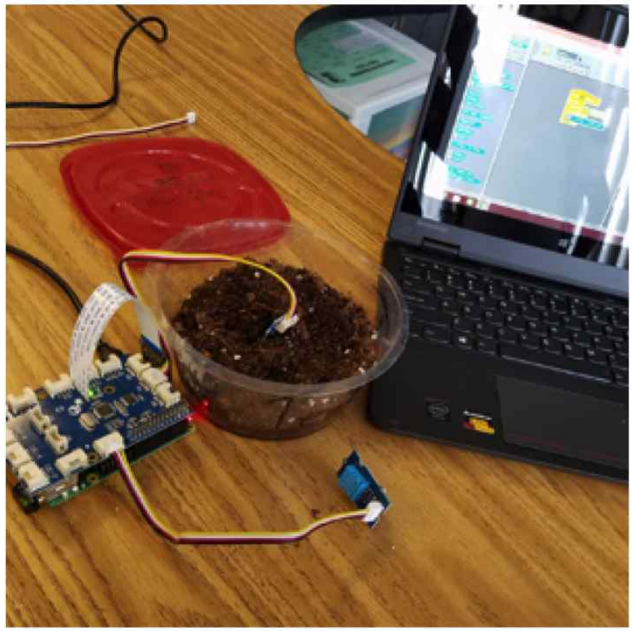
What do you need? (Besides Raspberry Pi 4)



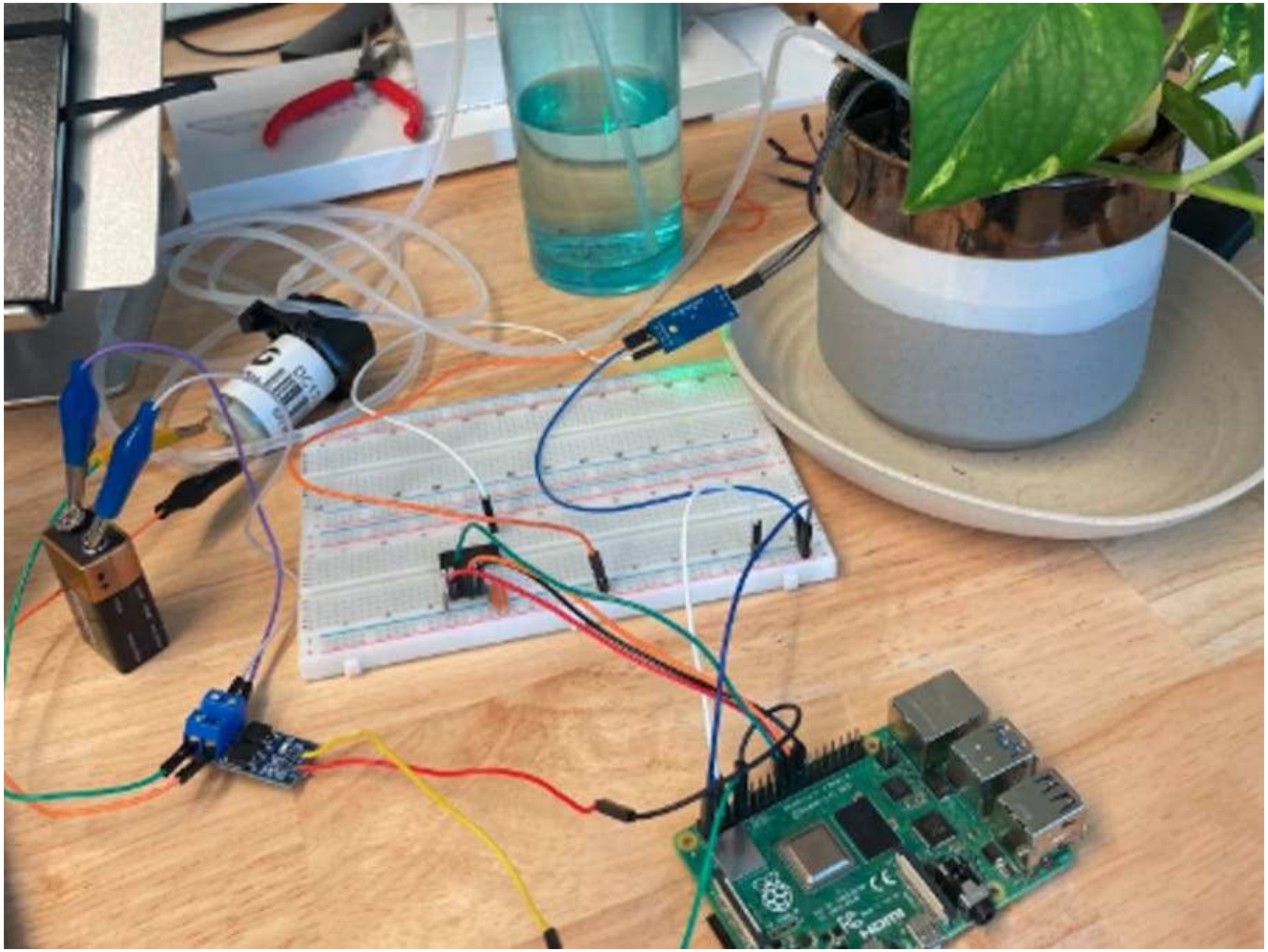
Grove Base Hat for Raspberry Pi 4



Grove – Soil Moisture Sensor

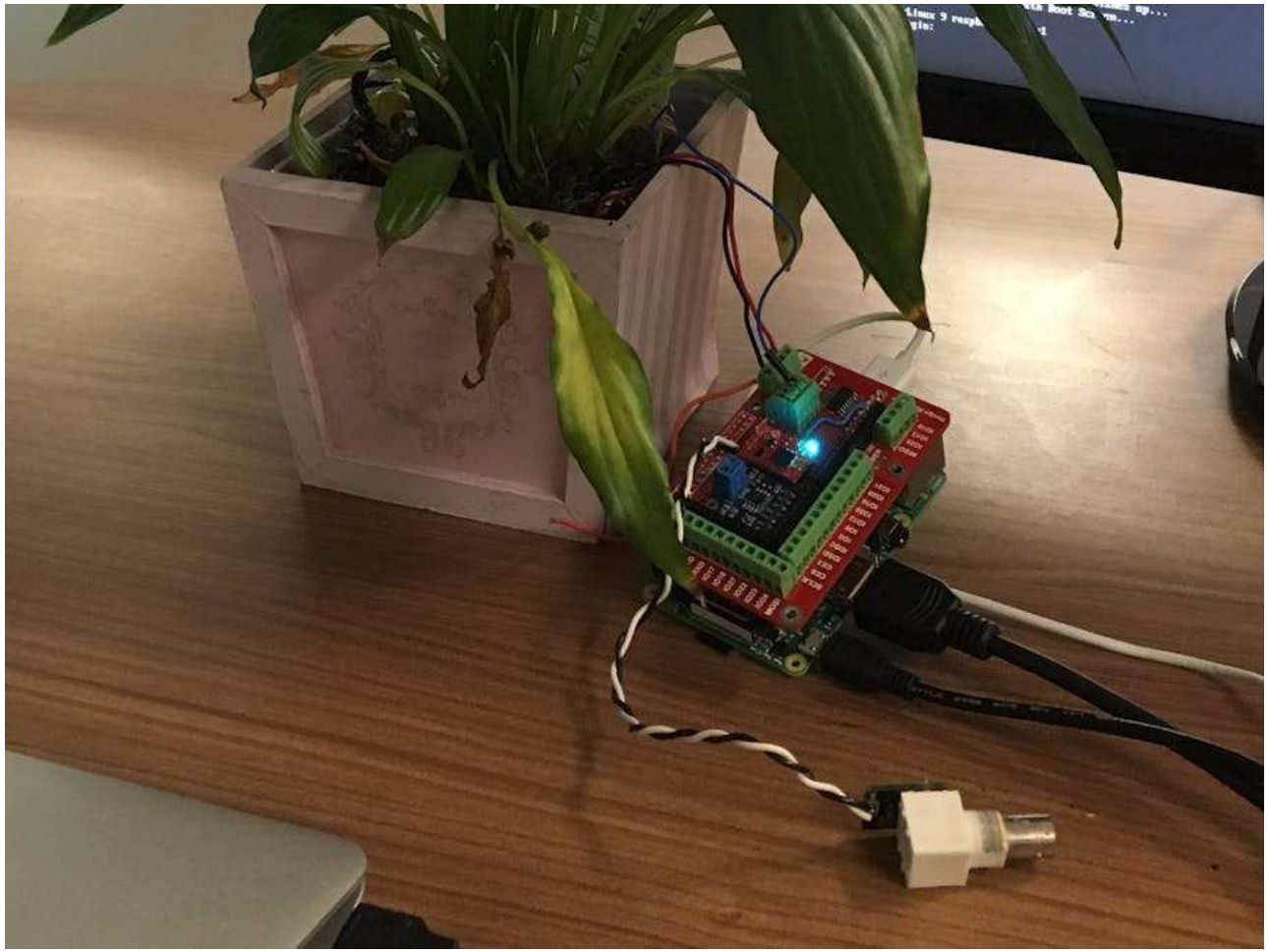


1-1 Plant Watering Robot With a Raspberry Pi



[Project 1: Check the link, here!]

1-2 Smart Plant Alerts Using nio, Raspberry Pi, and Twitter

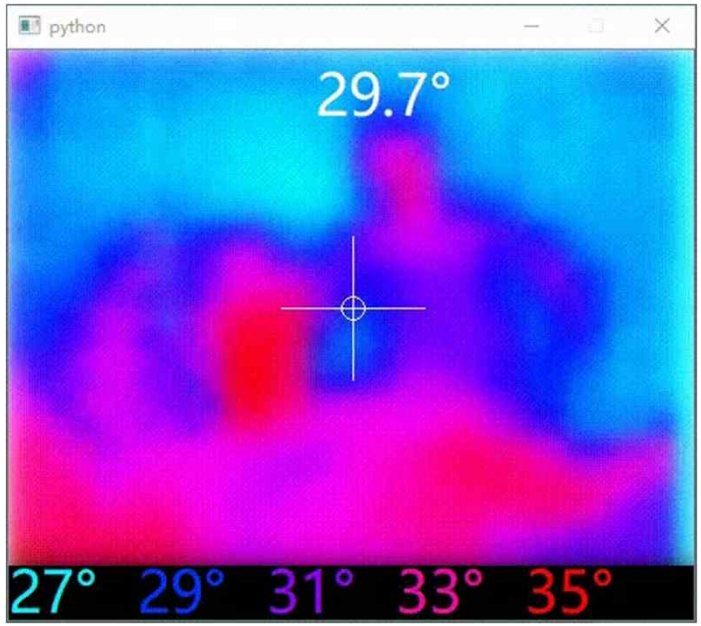


Project2: Check the link, here!

2-1 Object tracking and detection

Idea:

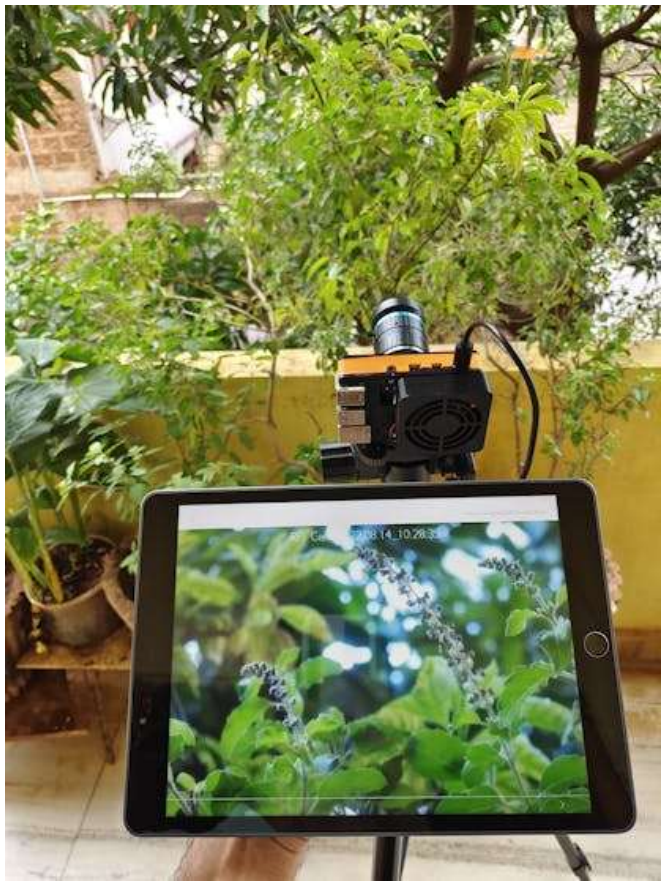
Using Raspberry Pi 4 to drive MLX90640 IR Thermal Camera var I2C interface in order to detect calorific objects.



Check the link, here

2-2 Object tracking and detection

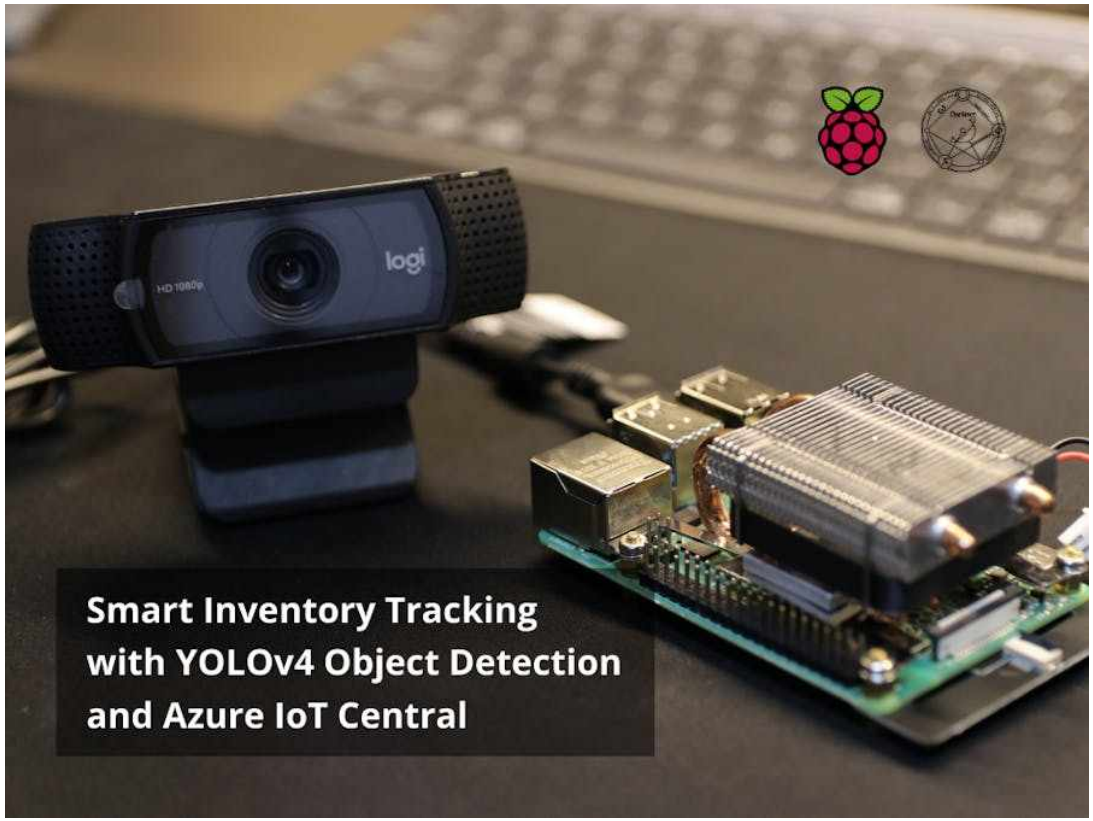
Idea: Pi Cam - A Remote Raspberry Pi Desktop/Camera/Server



[Check the link, here]

2-3 Object tracking and detection

Idea: Machine Learning Smart Inventory Tracking with Raspberry Pi



[Check the link, here]

2-4 Object tracking and detection

Idea: Face Recognition On Raspberry Pi 3

Project 1: Check the link, here

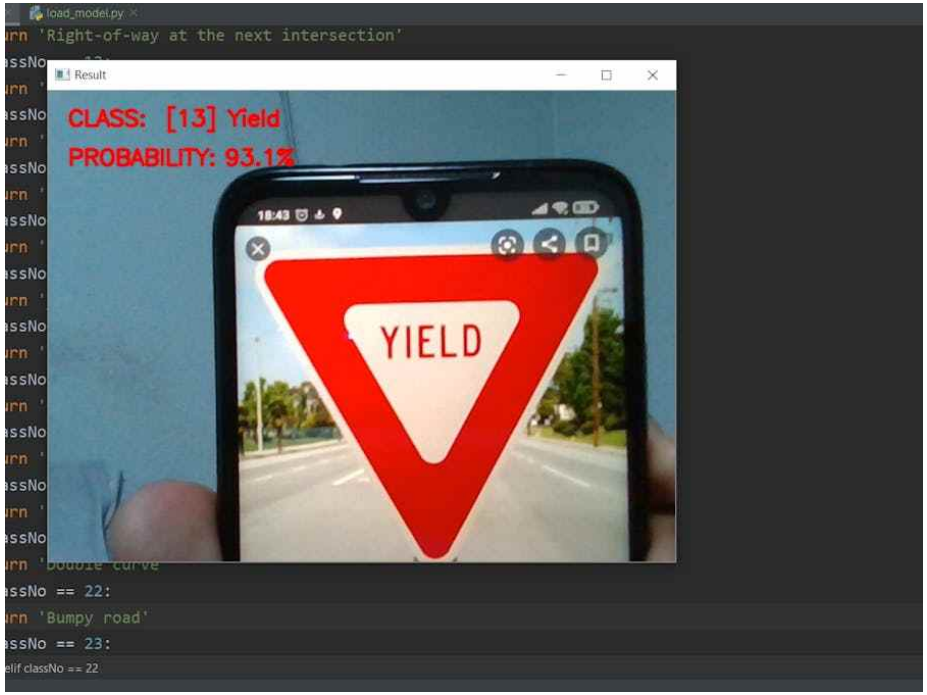
Project 2: Check the link, here

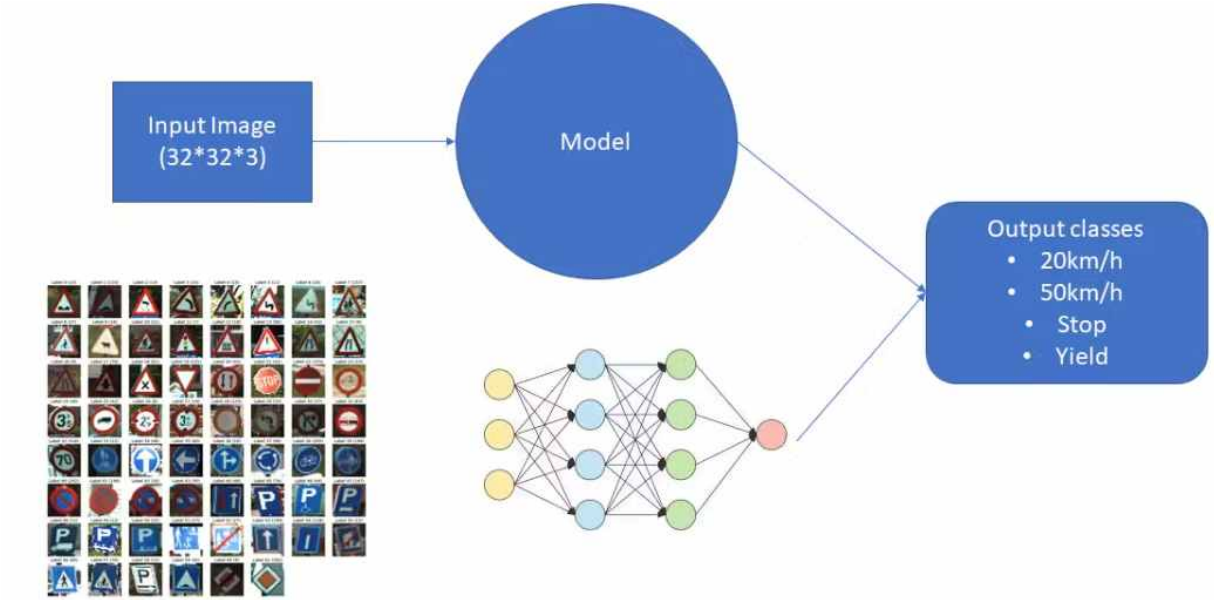
Project 3: Check the link, here

Face recognition with OpenCV, Python, and deep learning

2-5 Object tracking and detection

- **Idea: Traffic sign classification using Raspberry pi and CNN**
- Classify various traffic signs using Deep Learning





[Check the link, here]

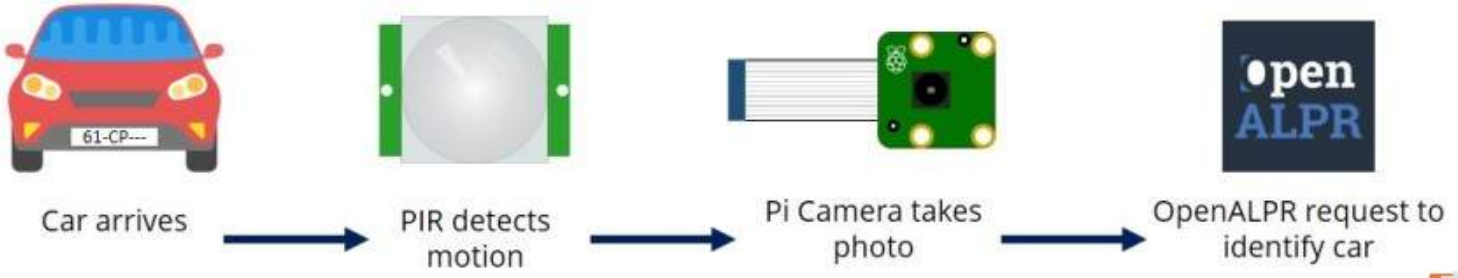
2-6 Object tracking and detection

- **Idea: TouchFree: Automated Temperature Checkup and Mask Detection**
- Currently, Temperature Checkups are done manually using Thermometer.
- Manual Checkups can be Inefficient, Impractical (in places with a large footfall), and Risky.

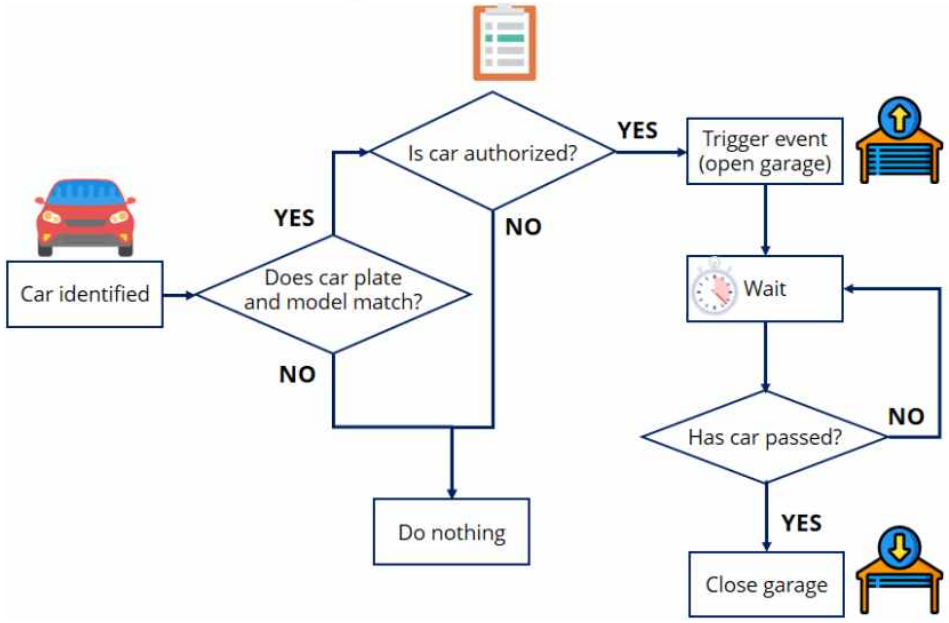
[Check the link, here]

2-7 Object tracking and detection

- **Idea: Car Plate Recognition System with Raspberry Pi and Node-RED**



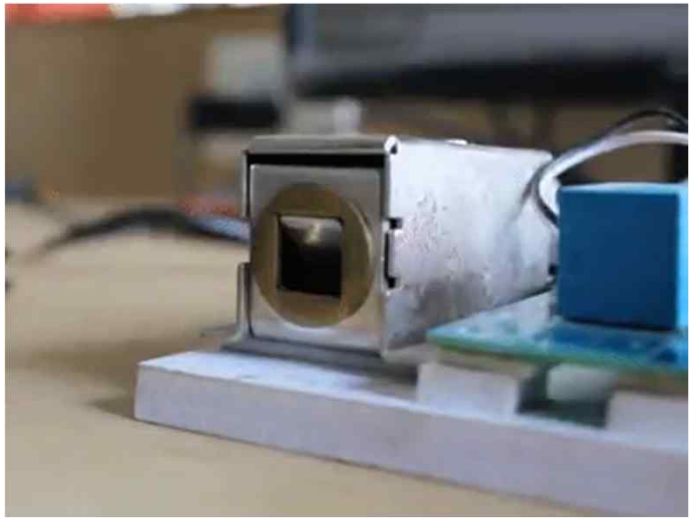
[Check the link, here]

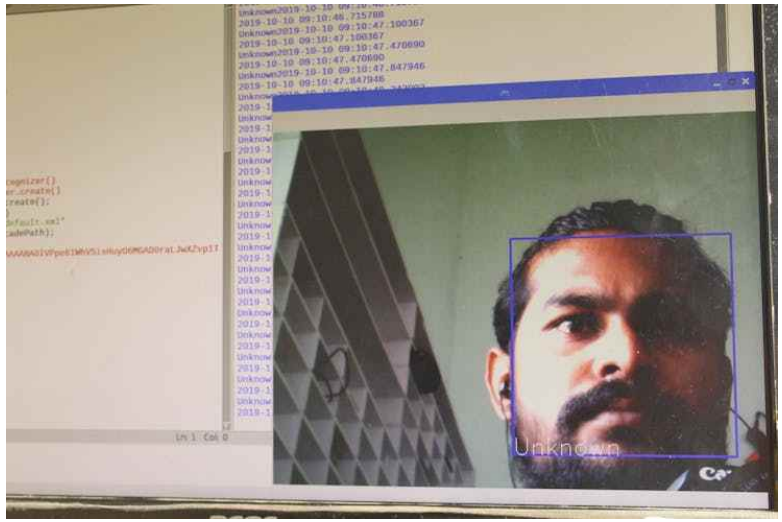


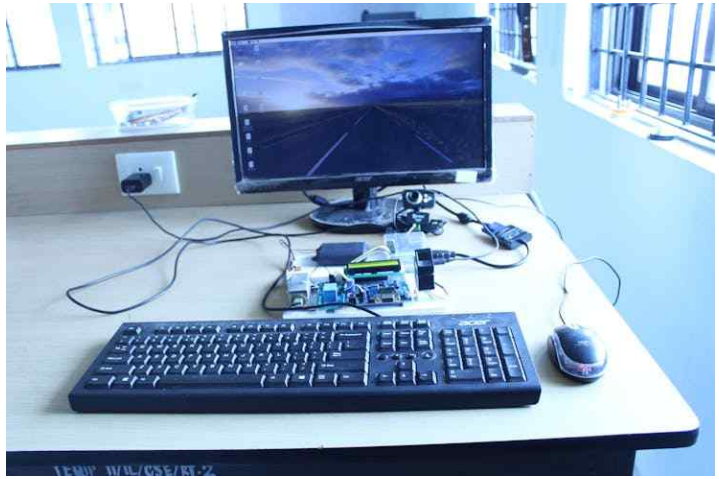
3-1 Smart Home

Idea: Three-Way Door Lock Security System - Raspberry Pi - OpenCV

Unlocks the door with three highly secured combinations, which are facial recognition, fingerprint, and password.







[Check the link, here]

3-2 Smart Home

Idea: Home Monitoring with Raspberry Pi and Node.js

It provides:

1- live video stream on any device using webcam,

2- Movement detection using PIR sensor,

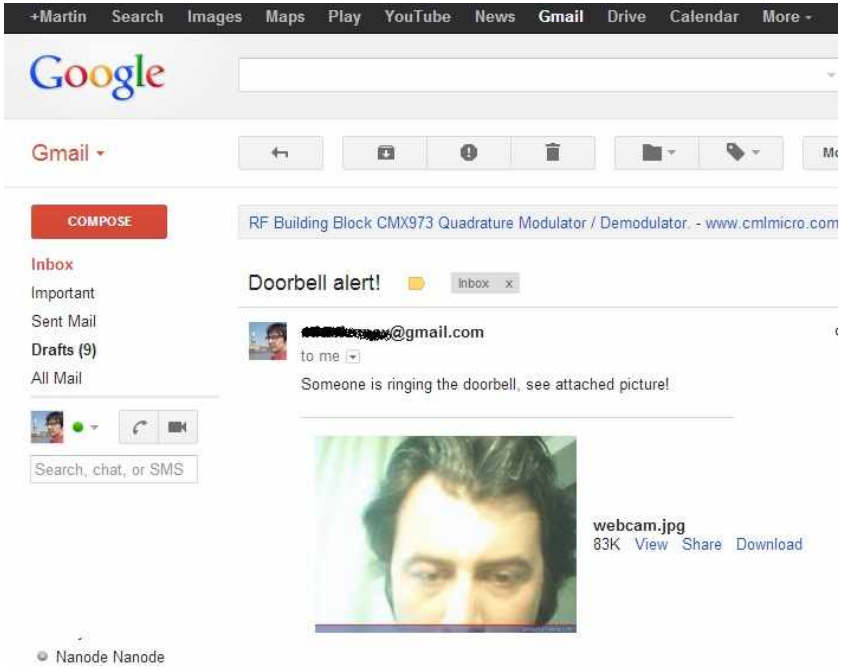
3- Sending SMS alarm to your device.

[Check the link, here]

3-3 Smart Home

Idea: Raspberry Pi email/SMS doorbell notifier + picture of the person ringing it

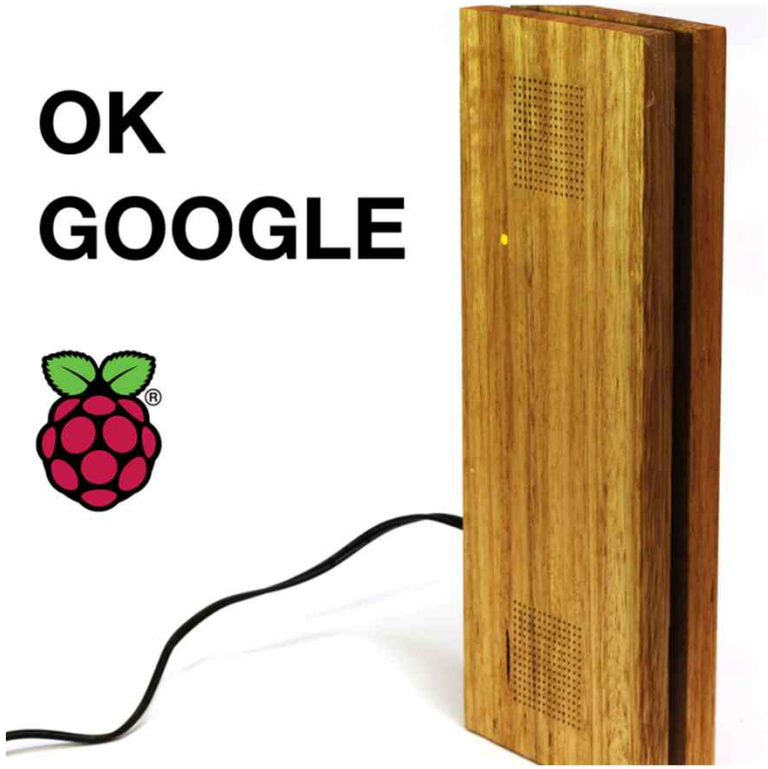
To tap into the doorbell base's LED and have a script look for the LED blinking; If it finds it blinking, then someone is ringing the doorbell. We take a picture and email it as attachment.

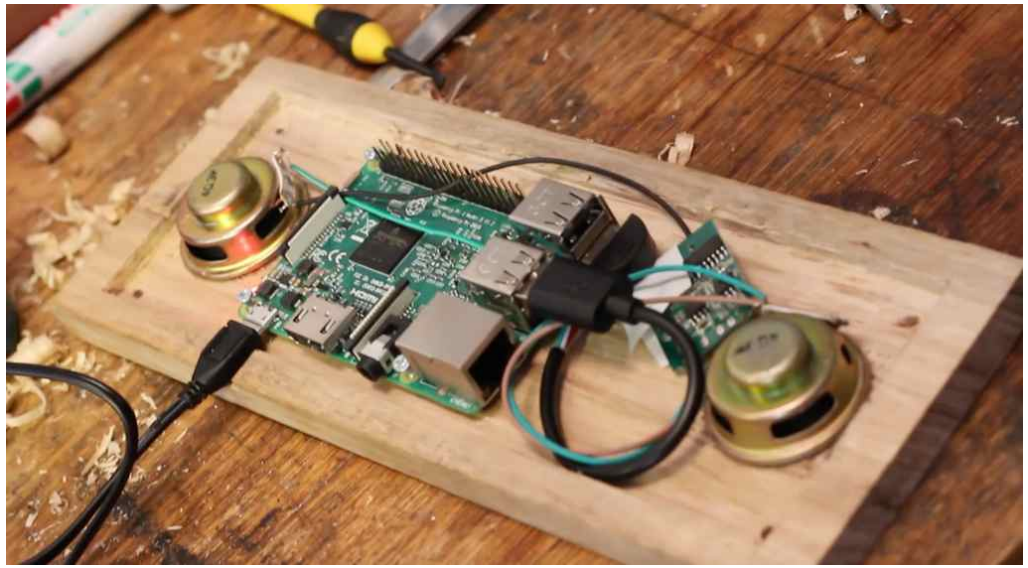


Check the link, here

Raspberry Pi Google Assistant With Sleek Wood Box

Idea: build Google AI Assistant using a Raspberry Pi, USB Speaker and USB microphone.





[Check the link, here]

Any Questions!