



# Face Recognition Based Door Lock System using Raspberry Pi

BY-

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# CONTENTS

- ❑ Introduction
- ❑ Components Required
- ❑ Methodology
- ❑ Three Phases Of The Project
- ❑ Libraries Used
- ❑ Haar cascade Classifiers
- ❑ Conclusion

# INTRODUCITON

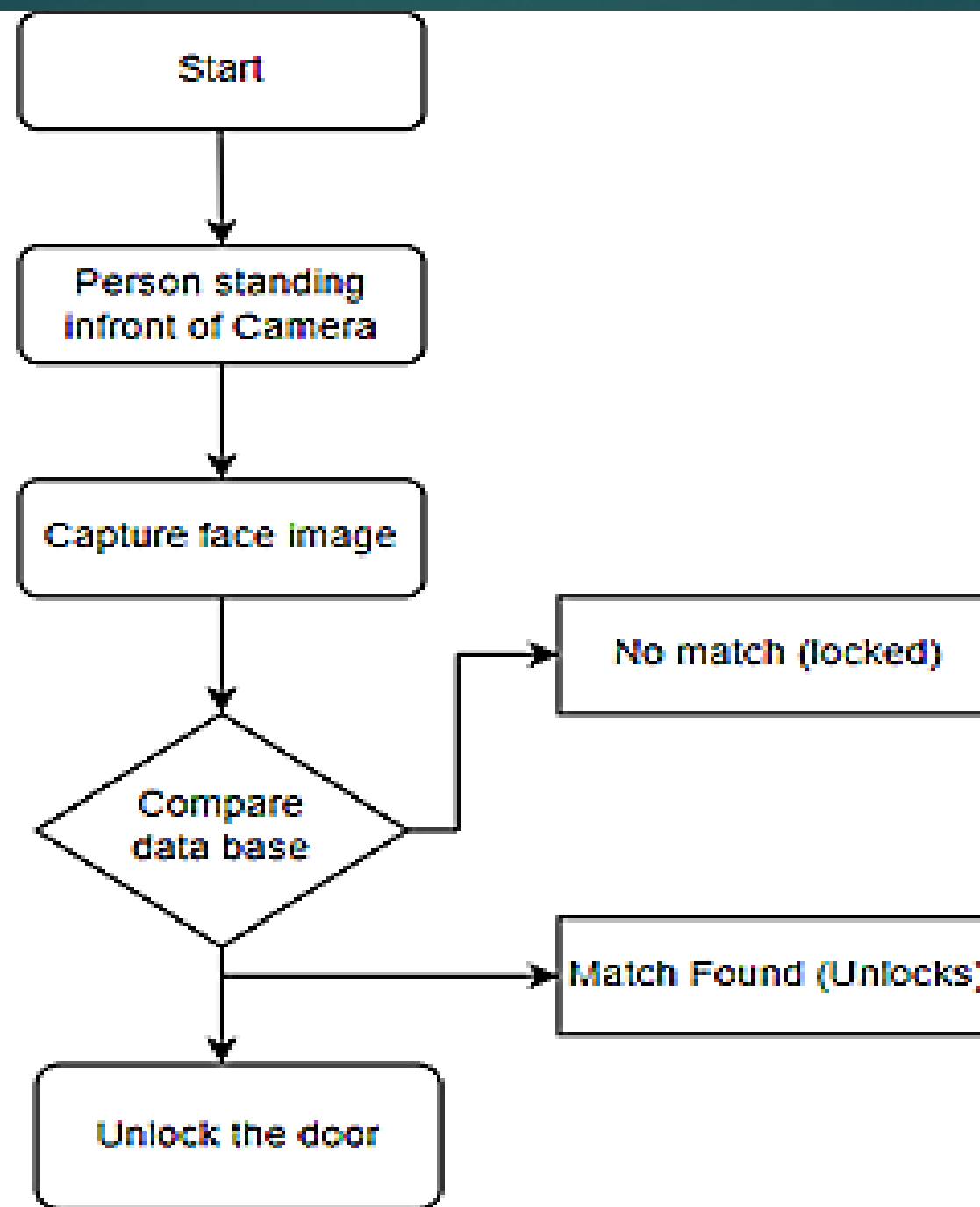
- ❑ The Internet of Things (IoT) is used in the effective installation of a door access control system.
- ❑ The person who is standing in front of the door is photographed with the aid of a camera, which is mounted on the wall. If the face is not recognized by the system, a warning will be generated.
- ❑ Using Internet of Things (IoT) technology, a user may control the access to a door.

# COMPONENTS REQUIRED

- ❑ Raspberry Pi 3 Model B
- ❑ Pi Camera
- ❑ Solenoid Lock
- ❑ Relay Module
- ❑ Jumper Wires

# METHODOLOGY

- ❑ Our project system can be operated in two different sections
- ❑ One for capturing and creating a database
- ❑ The other section is to capture the image and which is used for identifying or comparing the images in the database.



# THREE PHASES OF THE PROJECT

## ❑ Data Gathering

We will collect the face samples that are authorized to open the lock.

## ❑ Training the Recognizer

We will train the Recognizer for these face samples.

## ❑ Face Recognition

Trainer data will be used to recognize the faces.

If raspberry pi recognizes a face, it will open the door lock. Here, a solenoid lock and a Pi camera will be used with Raspberry Pi to build this Face Recognition based door lock system using Raspberry Pi.

# LIBRARIES USED

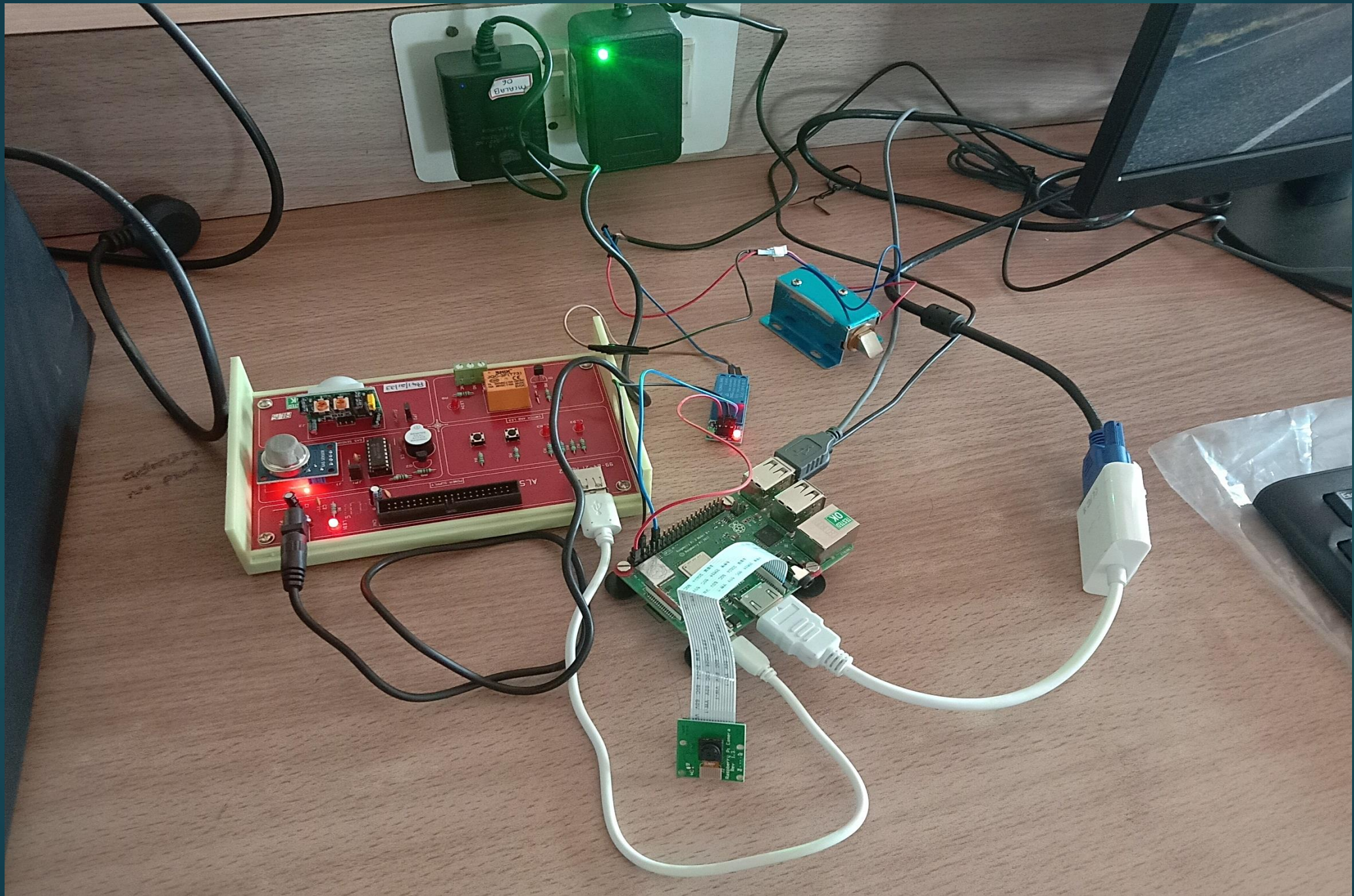
- ❑ **OpenCV:** OpenCV library is used to detect and recognize faces.
- ❑ **dlib:** dlib is the modern toolkit that contains Machine Learning algorithms and tools for real-world problems.
- ❑ **face\_recognition module:** This library used to recognize and manipulate faces from Python through the command line.
- ❑ **imutils:** imutils is used to make essential image processing functions such as translation, rotation, resizing, skeletonization, and displaying Matplotlib images easier with OpenCV.
- ❑ **pillow:** pillow is used to open, manipulate, and save images in a different format.



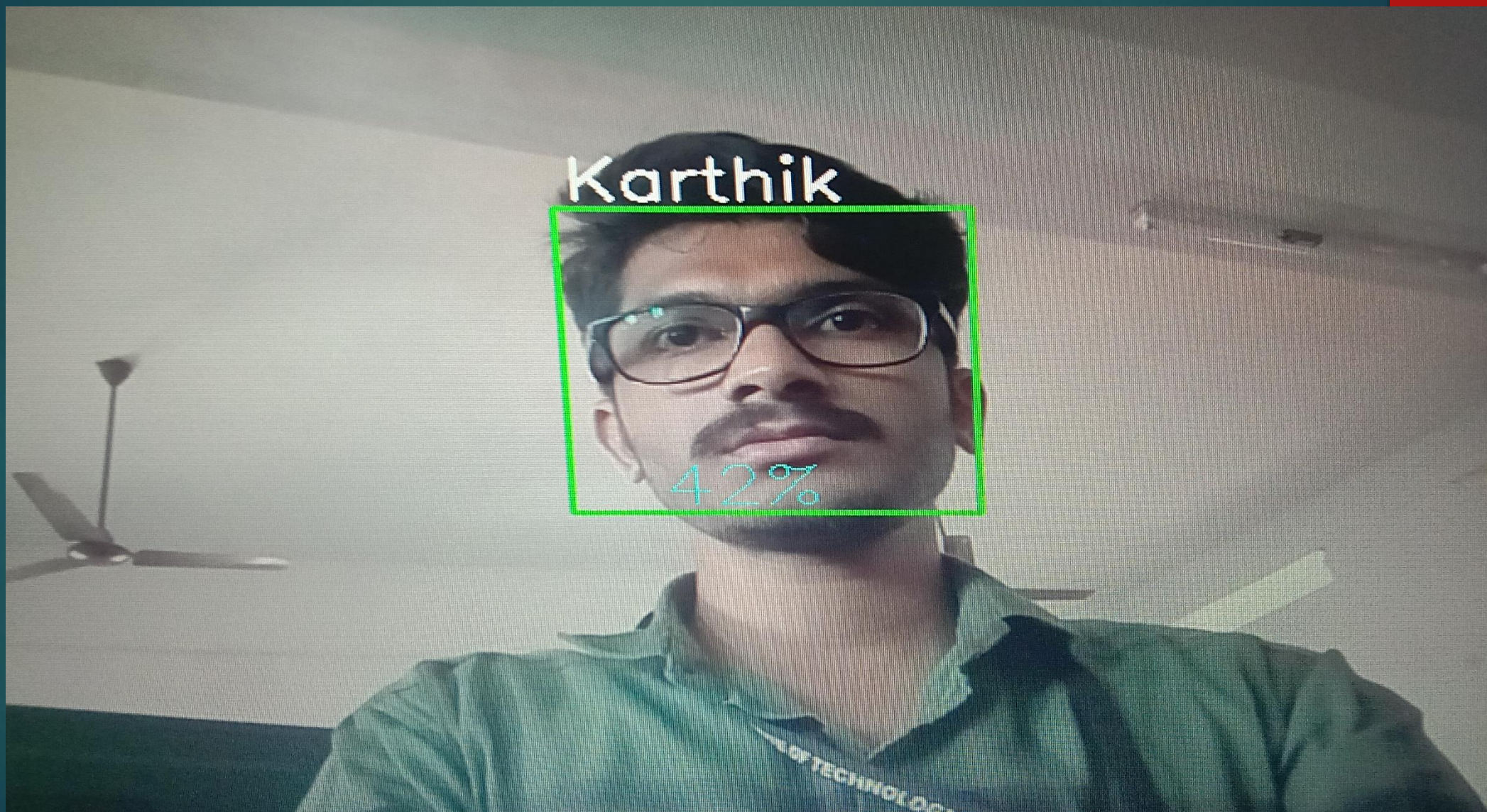
# Haar cascade Classifiers

- ❑ The use of purely Haar feature-based cascade classifiers is a powerful element detection method.
- ❑ This is a tool that lets you know a completely based method with layering capabilities, including many large and trivial images.
- ❑ Used to search for elements in the image.









# CONCLUSION

- ❑ In conclusion, a face recognition door system using Raspberry Pi is a promising technology that can provide an efficient and secure access control solution.
- ❑ The system can recognize faces with high accuracy and speed, while also providing a more convenient and contactless method of entry.
- ❑ Additionally, the system can be customized and expanded with other functionalities, such as integration with other smart home devices and services.



THANK YOU