**Smart Home with Virtual Assistant Using Raspberry Pi**

**Alternative Title:**

Ai and Iot Based Door Security System Using Raspberry Pi

**Aim:**

Aim of this project is to develop a raspberry pi and AI based door security and remote door unlock system when owner can't be available at the door.

**Introduction:**

 Advancements in technology push us to change the existing day to day objects into smart systems. To change and modernize any object we need to eliminate its drawbacks and add extra functionality. When it comes to security systems, we can't blindly trust the old and conventional security methods. Some of the major drawbacks in conventional door lock are that anyone can open that by duplicating the key and we need to present over door if we want our friends and family to enter our house.

 To overcome these type of drawback, today lot of security systems available in market like fingerprint door access system, voice controlled door access system. Likewise Face recognition is one of the advanced features to access the door. Today we are use facial recognition to unlock the smart phones. Past years, we can't use camera other than smart phone and computer. But in last few years presence of raspberry pi enables to access image processing with any portable embedded systems. With use of Raspberry pi we can perform facial recognition on a standalone embedded system and we can use it anywhere. In this system we are going to use Raspberry pi as main controller along with web camera or Pi camera. This system can identify house owner and relatives and friends faces by training priorly. If the detected face at door is matched with existing dataset it will automatically unlock the door. Otherwise it sends the captured face to owner through cloud database. Which means user can identify from anywhere who is present at his door and also he can control the door. If the person is unknown and try unlock the door without owner permission the system sends the information to nearer police station.

**Existing system:**

 Existing system uses face recognized door unlock system with virtual assistant which is also used to control the home appliances. It can identify the person present at the door is known or unknown. If the person detected as unknown person it will send the image of the person to owner via SMS or email.

**Proposed system:**

 In the existing system user only can identify the person standing infront of the door. But he can't control the door remotely and if the person is known and not in trained dataset user cannot control the door and there is a need of manual operation. In proposed system user can control the door and home appliances from anywhere.

**Block Diagram:**

Cloud Database



Power Supply

 User



Raspberry Pi

Camera

Solenoid Lock

**Block Diagram Description:**

 In this Block Diagram, Camera is connected with raspberry pi. In raspberry pi the owner face, relatives and friends faces are trained in various angle and different environments and stored dataset. Raspberry pi connected to cloud via WiFi or LAN connection. When the person detected as known person Raspberry pi unlock the door by using solenoid lock connected with door. This lock can also controlled manually by user via mobile application

**Requirements:**

**Hardware Requirements:**

* Camera
* Raspberry Pi
* Solenoid Lock
* Android application

**Software Requirements:**

* Language : Embedded ‘C++’,Python
* Compiler : GCC Complier.
* OS : Linux