

Embedded Systems -2

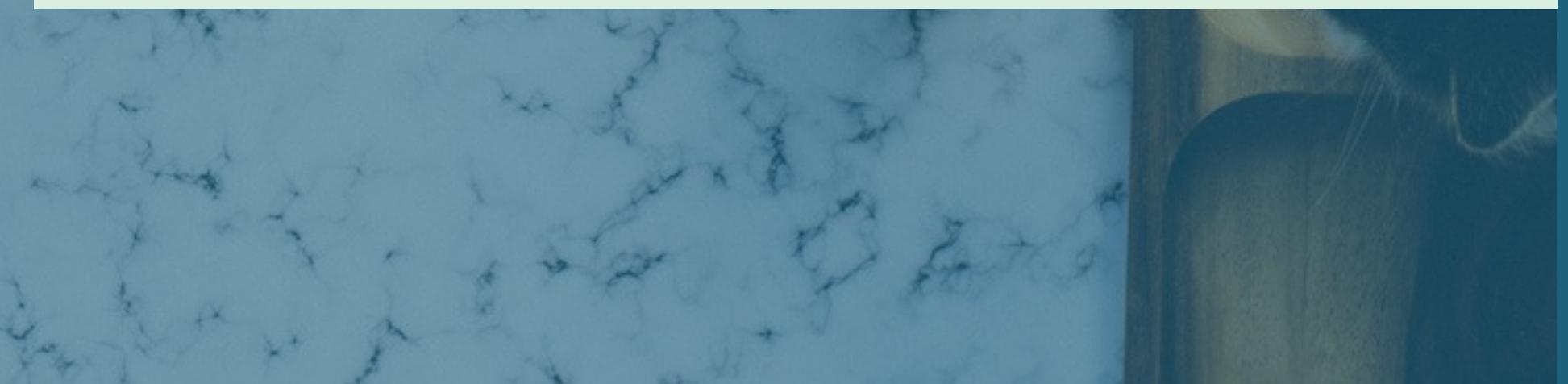
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SMART DOORBELL

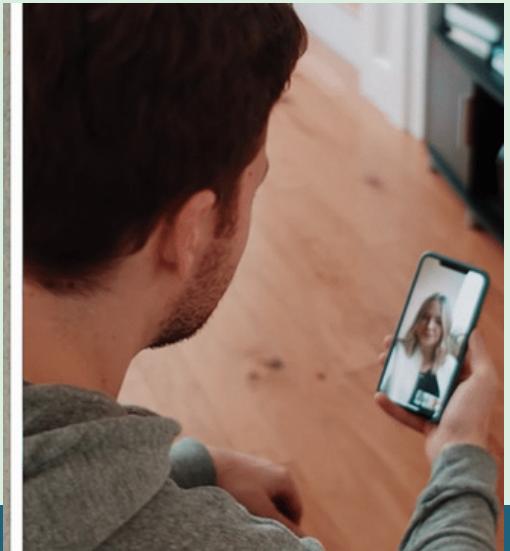
[USING RASPBERRY PI]



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INTRODUCTION



Our system connects WiFi-enabled Android devices with firebase server using Raspberry Pi and enables user to answer the door when the doorbell is pressed. There will be two-way communication i.e. on both sides -user and arriver audio and videos can be seen. Moreover the door can be opened and closed with the help of mobile itself.

OBJECTIVE

Starting from small houses to huge industries, surveillance plays very vital role to fulfill safety aspects as Burglary and theft have always been a problem. In daily life, people have the need to know, Identify of a visitor who comes to their homes, regardless of they are there at that time. Sometimes there occurs a situation where disable people are alone at home or they stay alone; could not get up from bed; old age people who stay alone and are more vulnerable to risks need something extra to boost comfort and security at their main doors. Thus, the main objective is to render comfort and security to user.

Components

Raspberry Pi3 B+



RASPBERRY PI 3B+



CAMERA MODULE



MINI-USB
MICROPHONE



PUSH BUTTON



JUMPER WIRES



WIRELESS
BLUETOOTH
SPEAKER



SERVO MOTOR



RASPBERRY PI
CASE

ASSEMBLING

- **STEP 1:**
Connect camera module and enable it in raspberry pi using configuration->interface
- **STEP 2:**
Connect and enable mini-usb microphone and put its percentage to 100 using alsa mixer.



ASSEMBLING

- **STEP 3:**

Connect bluetooth speaker to raspberry pi by connecting it clicking on bluetooth icon and selecting it as audio output device via right clicking on sound icon.



- **STEP 4:**

Servo motor has three wires - orange, red and brown. Red wire indicates power and needs to be connected to 5v pin on raspberry pi i.e first on top right [pin-2] as indicated in image. Brown wire is meant for grounding and needs to be connected to 5th pin from left side [pin-9-GND]. The orange wire is for connecting to gpio pin and in our case we will connect this wire to gpio pin 17 [pin-11]; 6th from left.



- **STEP 5:**

To connect push button attach one wire to GND pin on raspberry ; in our case pin-6 i.e. 3rd pin from the top right. Attach another wire to gpio pin 2; i.e. second from top left[pin-3]. We will use this push button to trigger all the actions.



CODING

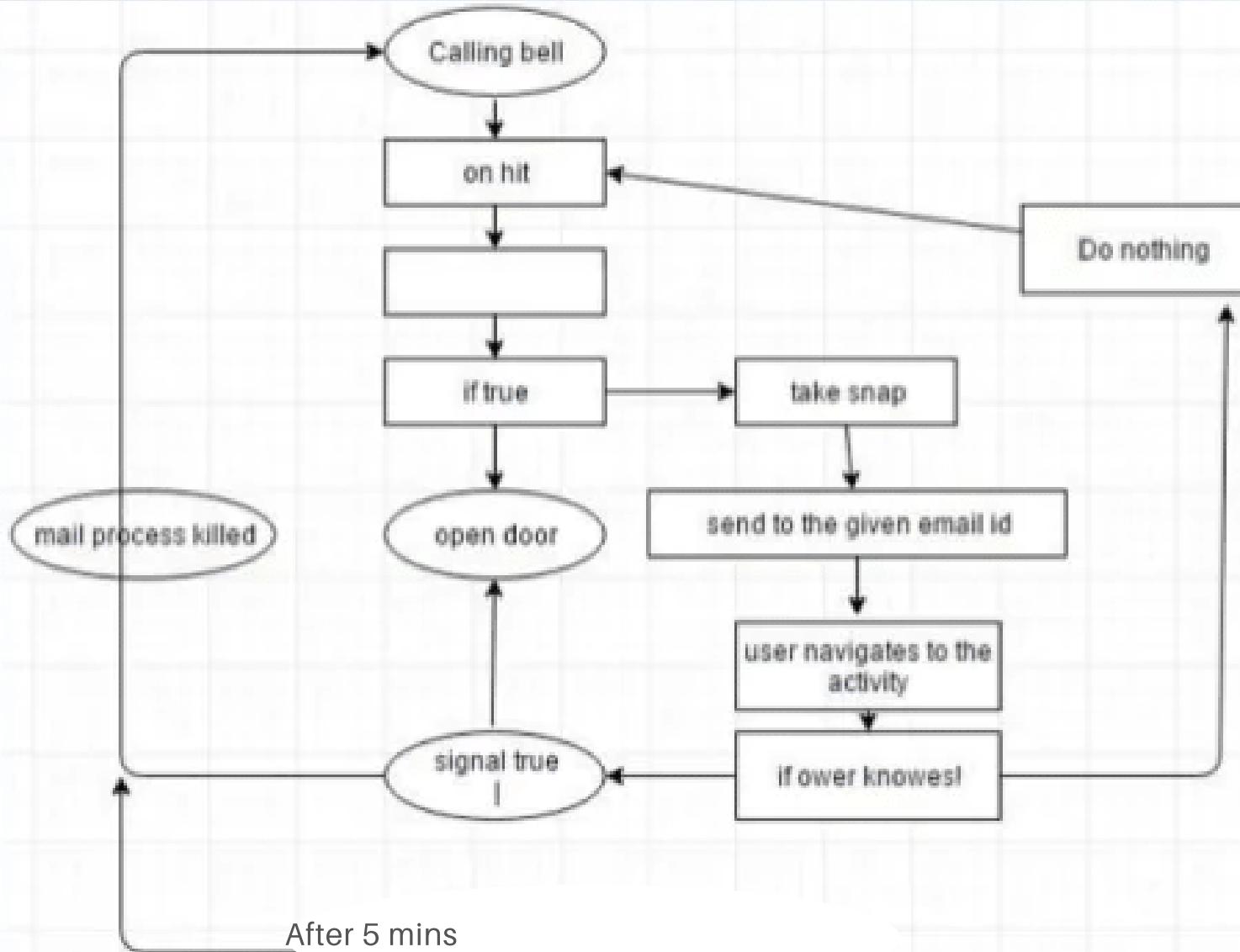
CODE FOR RUNNING DOORBELL

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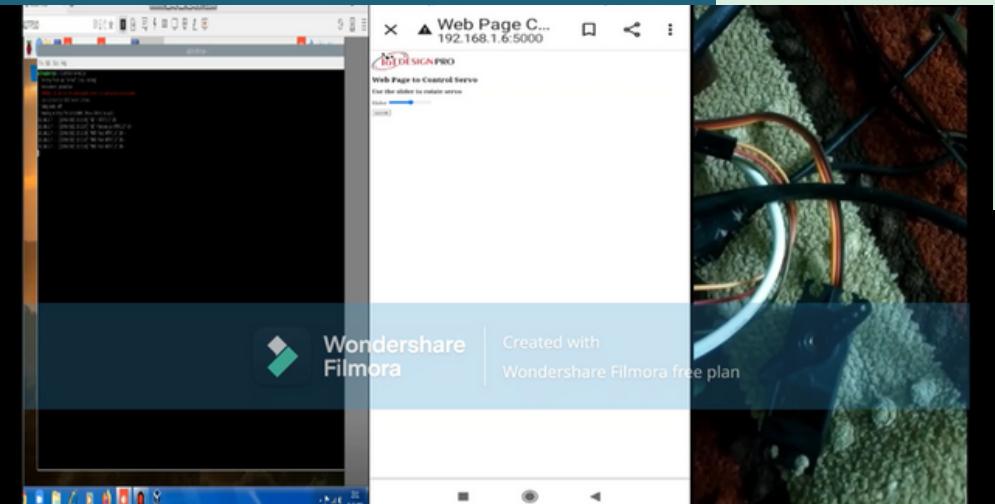
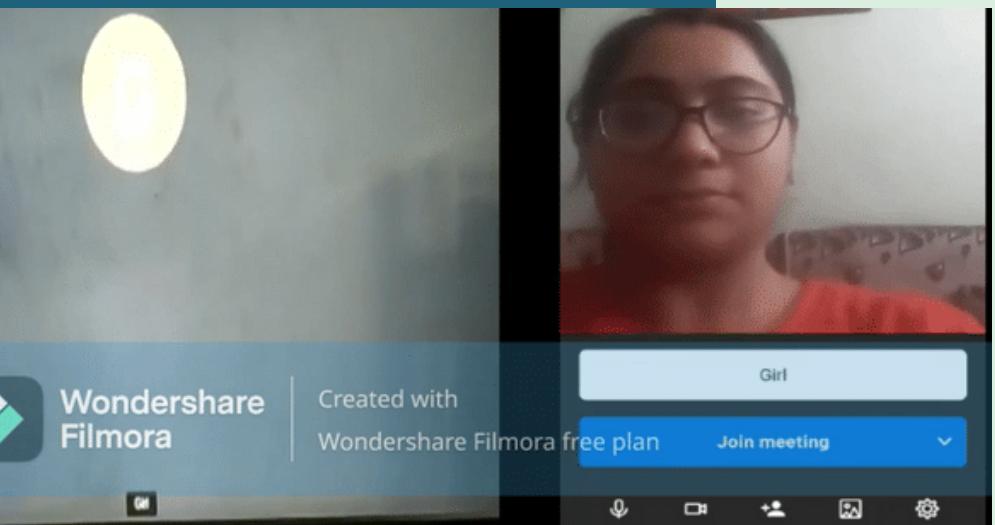
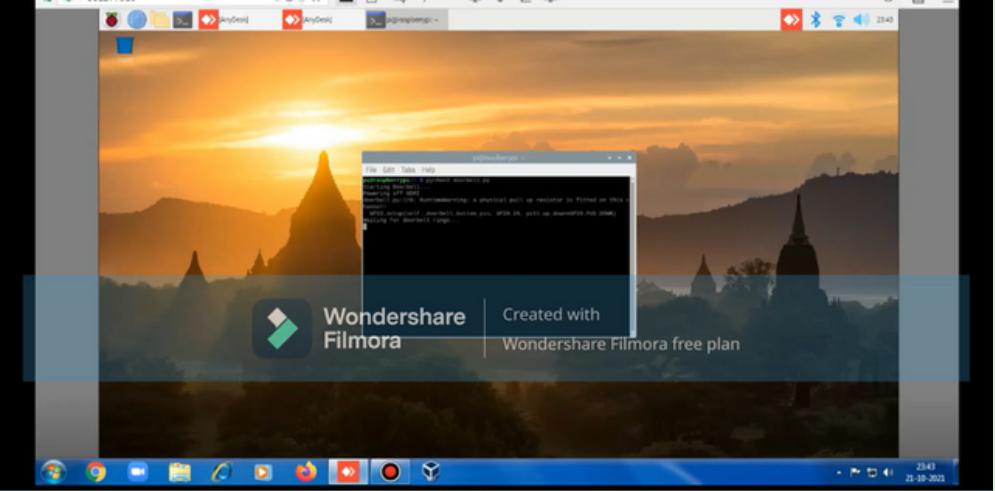
CODE FOR SERVO MOTOR

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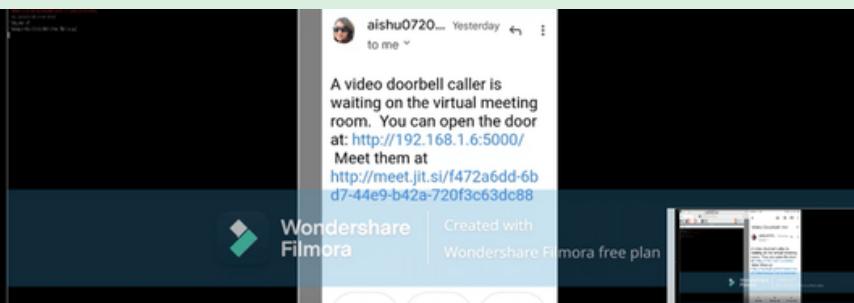
FLOWCHART



WORKING



- Person at door clicks the bell.
- The button sends the signal to raspberry pi.
- The raspberry pi sends high voltage to output pins.
- Live video and audio chat is carried out between arriver and the owner through link automatically sent in email.
- If owner wants to open the door he can open with another link sent in email by sliding direction of slider.



CONCLUSION



Hence as this technology offers a better safety there has been a boom in use of this kind of devices. Our system will combine many of the existing technologies into one so as to develop a better solution. A new feature has been added i.e. automatic door opening and locking.





THANK YOU