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Development of Canny Home security system using Telegram application

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Abstract- Home security and automation are becoming increasinglyprominentfeaturesonmobiledevices.Theaimofthis paper is to design and implement affordable, flexible and fast monitoring home security system using Raspberry pi with cloud based telegram messaging application. The system is designed to detect theft, the image of person is captured by camera andsends to mobile application and alarm as well as all home lights will get on, For controlling, raspberry pi module, Python and lua languages are used along with telegram messagingapplication.

Keywords:*Home Security , Home Automation*.

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I. INTRODUCTION

Today security and safety is becoming gradually widespread bit by bit due to its several benefits, and with such advancement happening, the security of one's home must also not be left behind. This paper presents a basic application of raspberry Pi in the field of home automation and Internet of Things, in which the control signal of the respective GPIO pin of the Raspberry Pi is controlled by the content of the message received by the application client running on the Raspberry Pi. The application used here is a cloud based multi-platform messaging application - '

'Telegram'. Nowadays robbery is on rise. So, there is an endeavour to build a safety system which will brilliantly manage this issue keeping user away from terror about home security in all cases. The system measured to be best only if it offers shield and monitoring that guard in contradiction of many threats, protecting home in contradiction of the element aswellasbreak-inandhomeattacks.Whenevertheuserisslept at night or away from his home for some purpose, it chances sometimesthatheisleftunconnectedwithpeoplewhovisithis place. These visitors may be known or unknown to user. For this the planned system consists of PIR motion sensor, PI camera. The PIR sensor which detects the presence of human appearance which will sends a signal to raspberry pi, and raspberry pi do four important operations theyare:

a. pi camera captures animage.

b. turns on all the lights existing inhome.

c. turns on the buzzer switch, buzzer is for neighbour's attention.

d. Raspberry pi sends the captured image to user through telegramapplication.

Also,itislikelytocontrolallthehomeappliancesbyusing samesystemwhichwillconversedinnextsectionofthispaper.

Everyone can control the home appliances remotely in this system using simply cloud based messaging application telegram, also it gives facility to user which is all family members are able to switch the home appliances using single raspberry pikit.

Problem statement:

Home automation and security systems face four main challenges-theseareexcessivecostofownership,inflexibility, poor manageability, and difficulty in achieving home security. The main ideas of this exploration is to design and contrivance a home automation system using IoT and that is capable of controlling most of the house appliances through an easy manageable telegram app interface with raspberrypi.

1.2 System overview

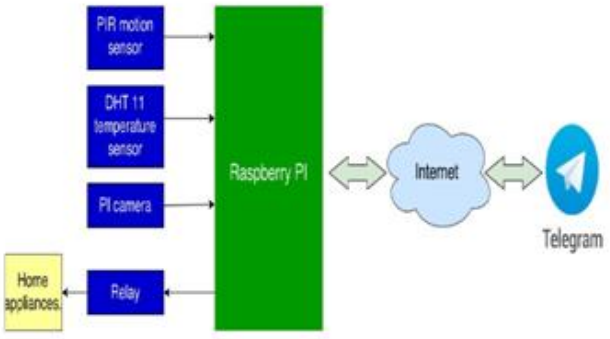

Fig. i Block diagram of proposed system.

There are some unique features that are offered in cloud based messaging application which is comfortable for the proposed system like low cost, small size, user friendly interface, very short response time and key features that extensive area coverage. Due to accessibility of internet is

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everyplace, user can interact with the system universally from the word.

Overall block diagram of the proposed system as shown in fig.1.Differentsensorsareinstalledatthedifferentplaceinthe home. The system responds to a message by triggering a set of instructions which may include a reply back to the sender and a python program which can further be used to take control of the GPIO pins on the Raspberry Pi. The python program can be used to either make the control signal via GPIO high orlow based on therequirements.

.The Raspberry Pi can also be connected to a camera and a set of instructions can be triggered according to the utilization. Inthisway,picturescapturedfromthecameracanalsobe sent over to the end user. There can be numerous otherapplications based on this algorithm. The PI camera and PIR sensor that is installed at the front door of the home interfaced with the Raspberry pi. When PIR sensor signal is high then PI camera capturestheimageofthevisitorandsendsthroughcloudbased messaging app (telegram) to the user i.e. owner and turn ON the entirely lights through relay existing in home as well as buzzer also.

One additional attractive feature of this system is that this system can control the home appliances using telegram app. Means one system gives two features one is home securityand another is home appliancescontrolling.

II. METHODOLOGY

2.1 Tiny overview about raspberrypi

RaspberryPiisacredit-cardsizedsoloboardcomputerunit thatisdevelopedintheUKwiththegoallineofreachingtothe people who cannot afford the mainstream computers available in the market and thus created a revolution in the field of personalcomputers.

Fig ii – Raspberry pi 3 model B.

One influential feature of the Raspberry Pi is the row of GPIO (general purpose input/output) pins These pins are a physical interface among the Pi and the external world. At the simplest level, you can think of them as switches that you can turn on or off (input) or that the Pi can turn on or off (output). 40ofthe26pinsareGPIOpinstheothersarepowerorground pins.

2.2 phases for Connecting telegram on raspberrypi.

First, update the packages using the following commands:

“sudo apt-get update

[ENTER]

sudo apt-get

upgrade

[ENTER]

Now to install the libraries:

sudo apt-get install libreadline-devlibconfig-devlibssl-dev lua5.2 liblua5.2-dev libevent-dev make

[ENTER]

Now to Clone GitHub Repository,

Git clone –recursive https://github.com/vysheng/tg.git && cd tg

[ENTER]

./configure [ENTER] make [ENTER] Running this command takes a little time and after the installation is done.

Now to navigate to the folder

tg cd tg [ENTER]

then bin/telegram-cli –k tg-server.pub –W –s

action.lua [ENTER]

The first time we start telegram we must enter the phone number.Youshouldreceiveonyourphoneasmsmessagewit h a code, enter it and hit "Enter" Now we are ready to use telegram,ifyousendamessagefromyoursmartphoneyouca n see it onterminal.

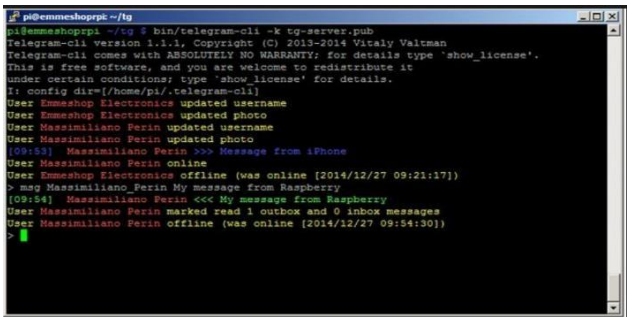

Fig iii – actual display screen of raspberry pi when telegram is installed.

2. Programming languages used for Implementation of Home security with raspberry pi and telegram application:

III. LUA SCRIPTING LANGUAGE –

The commands which are send from telegram app are not comprehensibletotheraspberrypihenceluascriptinglanguage is used to decodes that commands received from user. Lua is a powerful, efficient, lightweight, embeddable scripting language. It supports procedural programming, object-oriented programming, functional programming, data-driven programming, and data description.

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3.1 python language –

Python is a widely used high-level programminglanguage for general-purpose programming.Python is a popular language for writing various utilities because of its simplicity and powerful packages. The combination of Raspberry Pi and Python can be used for multiple purposes such as Connecting Raspberry Pi to multiple sensors and receiving data from them or controlhardware.

3.2 Lua language –

Lua is a powerful and fast programming language that is easy to learn and use, and to set in into your application.Lua is aimed to be a lightweight embeddable scripting language. It is used for all types of applications.from games to web applications and image processing.

3.3 Flow of system

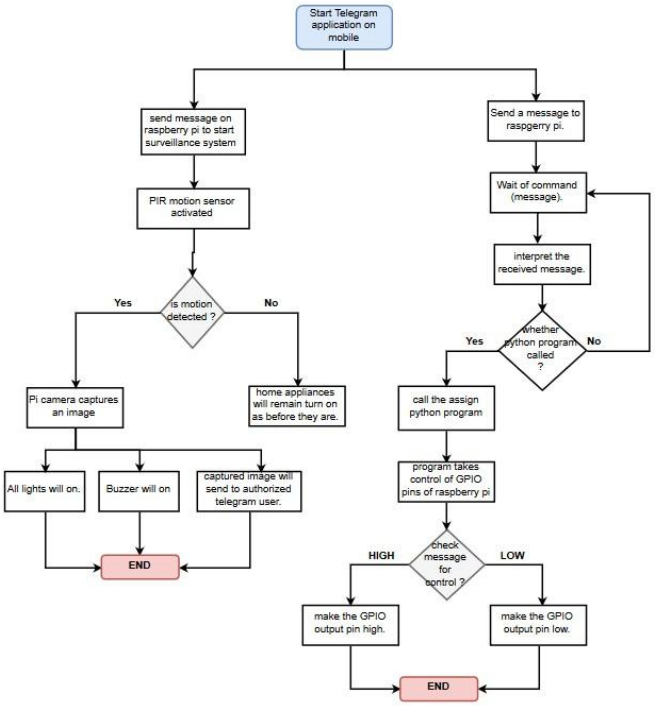

Fig iv. User flow for working of smart home security and home appliances controlling using telegram application.

IV. CONCLUSION

The paramount aim of the paper was to design a home security system using Raspberry pi and messaging app telegram. So, it helps people feel trustworthy about their home whether they are far off from their home. This paper is based on the latest version model B of Raspberry pi 3, and the programminglanguageusedforthedevelopmentofthisproject is Python and lua script. The primarily cost of this project is very low and can be easily operated. Even our home will undergo its own transformation towards the smart homes that will be in constant interaction with the grid in an effort for better energy management and full home automation to ensure comfort, security andprivacy.

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