



PERSONAL SAFETY DEVICE WITH FAKE CRIME ANALYSIS USING IOT AND MACHINE LEARNING

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Abstract: In today's world scenario personal safety is one of the most important issues to be addressed in our country. Whenever a person encounters any kind of harassment, sexual abuse or molestation. They need urgent help at that time, proper reachability is not present for them. Apart from being aware about the significance of personal safety, it is essential that they are provided with protection during those critical times.

The previous current system is helpful in detecting the person's location after the criminal offense has been committed. In this project we introduce a new technique via smart device, this device makes use of wireless sensors to communicate and send the message to the predefined authorities. The project idea is to provide a quick responding and reporting safety device for everyone. It reports a situation just by pressing button on the smart device. The device mainly works on the concept of emotion recognition which can achieve through CNN machine learning algorithm. The captured image is tested whether it is fake or genuine before sending it to the authorities.

Keywords: Machine Learning, CNN Algorithm, Deep Learning, IoT.

I. INTRODUCTION

Internet of things abbreviated as IoT comprises of the web enabled objects that collect the information and act accordingly using the sensors, processors and other communication equipment's. Nowadays crimes such as robbery, harassment and other illegal activities are increasing it has a major concern to protect common people from such crimes. Even though the technology is growing fast with pace and several equipment's has been developed to prevent crimes still people are facing many problems including major harassments and robbery.

Crime against women are our major concern, such as rape, economic deprivation, sexual abuse, intimidation, stalking, kidnapping and murder. But despite of the strict laws in our country many mass number of crimes are being registered every day. Keeping all these things in concern our project aims to come up with a solution by introducing an IoT based device. This device contains a buzzer which when pressed sends a location of the person to the authorities, so that unfortunate incident would be avoided. The device is integrated with various sensors like pulse rate sensor, button, GPS (Global Positioning System), Temperature Sensor, Camera, Audio.

All these Sensors are connected to Arduino UNO, which is a Micro Controller. Above all these problems our project aims at detecting whether the complaint is genuine or fake before reaching to the authorities. this is to prevent the unnecessary trigger for authorities and to save their quality time. And detection of fake and genuine also helps in unnecessary blame for innocent one. When the button is pressed the camera captures the image validates the image based on expressions using CNN algorithm, and based on health sensors. If parameters satisfy then the crime is detected as genuine and the message is sent to authorities or else it is considered as fake. The idea is to design a device provide a one stop solution for crimes and also to detect genuine and fake crimes.



II.LITERATURE SURVEY

Sl. No	Techniques	Benefits	Draw Backs	References
1	1. Smart device with raspberry pi is interfaced. 2. The advanced automatic technique used. 3. Unsafe situation recognized by pulse sensors.	1. Automated system. 2. Provides better result.	1. Expensive 2. Trigger authorities unnecessarily.	[1]
2	1. Advanced sensors embedded in a wearable dress. 2. Advanced sensors. 3. ATMEGA8 micro. Controller with Arduino tool.	1.Safety device 2.legitimate proof of wrong doings 3. User Friendly	1. Many people can access. 2. Can harm the victim too.	[2]
3	1.Two primary GSM devices 2. AT instructions controller.	1.Video captured 2. Audio Recorded	1. Finger print may not work always.	[3]
4	1.1GHz BCM2835 single-core processor with 512MB RAM 2.The ESP8266 Wi-Fi Module	1. Safety to women and children. 2. Helps preventing crime.	1. Creates buzzer in surroundings.	[4]
5	1. Machine Learning algorithm. 2. CNN Algorithm.	1. Data-base training And learning.	1. Fake genuine not able to find	[5]

III. METHODOLOGY

The primary objective of this research project is to provide security to people and to detect fake crime analysis.

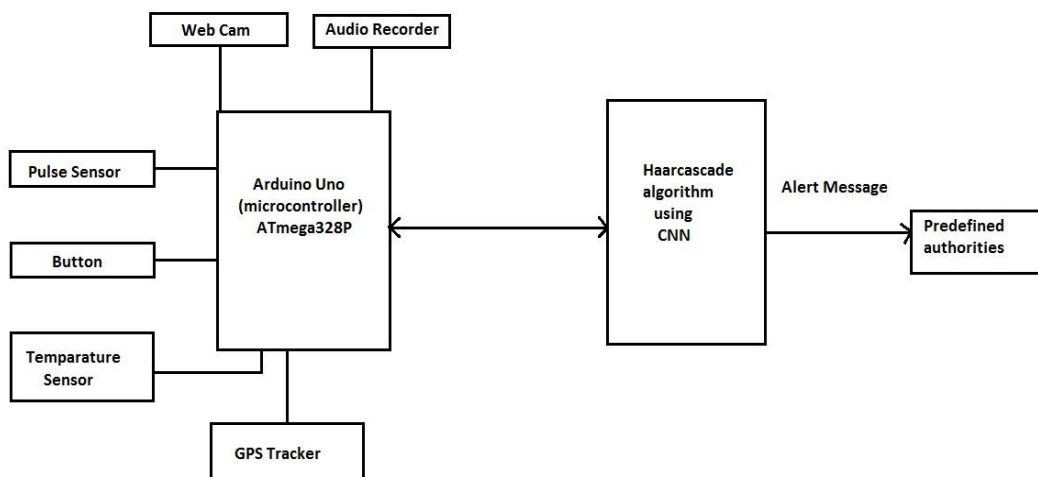


Fig 1. System Framework

The Privacy and protection system for a person’s safety is introduced in a Embedded system consisting of an Arduino Uno based microcontroller and CNN Machine learning algorithm. Along with Arduino Uno some components which interfaced are GPS, Pulse sensors, Temperature sensor, Camera, Micro phone and Button are interfaced with python. The camera is used to capture the image and the microphone to record the audio. The captured image is tested whether it fake or genuine by using CNN algorithm before sending to the authorities. In CNN algorithm, an image is tested genuine by



matching it with the facial expressions such as anger, sadness, frustration etc. For further processing in order to reduce the false positive both pulse readings and microphone audio is analysed.

a) **Arduino UNO:** Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects. This board can be interfaced with other Arduino boards, Arduino shields, Raspberry Pi boards and can control relays, LEDs, servos, and motors as an output.



Fig 2. Arduino Uno

b) **Pulse Sensor:** The MAX30100 is an integrated pulse oximetry and heart-rate monitor sensor solution. It combines two LEDs, a photodetector, optimized optics, and low-noise analog signal processing to detect pulse oximetry and heart-rate signals.

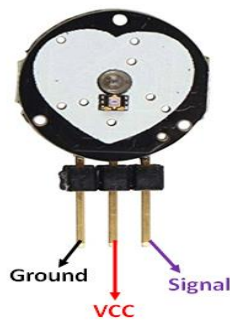


Fig 3. Pulse sensor

c) **Temperature Sensor:** LM35 is a temperature sensor that outputs an analog signal which is proportional to the instantaneous temperature. The output voltage can easily be interpreted to obtain a temperature reading in Celsius. The advantage of LM35 over thermistor is it does not require any external calibration.



Fig 4. Temperature Sensor

d) **GPS Sensor:** The functionality of an IoT GPS tracking device at a glance. The information is transmitted to a server via a wireless radio standard: The satellite broadcasts signals. A GPS tracker 2 uses this information to calculate its position and passes it on to a server 4 via radio 3.



Fig 5. NEO6MV2 GPS Module

e) **Camera:** Camera, in photography, device for recording an image of an object on a light-sensitive surface; it is essentially a light-tight box with an aperture to admit light focused onto a sensitized film or plate.



Fig 6. Camera

f) **Audio:** The sound sensor can detect the sound strength of the environment. The main component of the module is a simple microphone and LM393 level converter chip. The sensor can provide both digital as well as analog output.



Fig 7. Mic

g) **Button:** When referring to hardware, a button is a physical switch that controls a device's function. Button is a user interface that is used to perform some action when clicked or tapped.



Fig 8. Button

1. Flow Chart

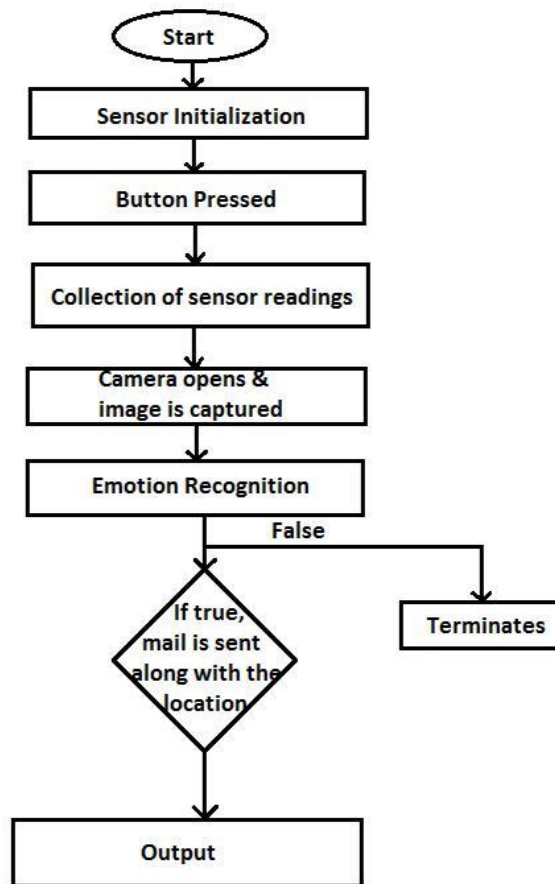


Fig 9. Flow chart of the system

IV. RESULTS AND DISCUSSION

when the device gets starts sensor initialization takes place and as the button is pressed by the user it checks whether the bpm >100, if the condition satisfies then camera opens and image is captured, image recognition takes place, if true then the mail is sent to authorities along with the location.



```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
Running. Press CTRL-C to exit.
COM5 connected!
--> b'13.965425x75.579387\r\n'
["b'13.965425", "75.579387\r\n"]
Latitude : 13.965425
Longitude : 75.579387
[ WARN:0] global C:\Users\runneradmin\AppData\Local\Temp\pip-req-build-t9hleyt8\opencv\modules\videoio\src\cap_msmf.cpp (438) `anonymous-namespace':::~SourceReaderCB::~SourceReaderCB term
ync callback
Running emotion recognition
sad
sad detected
recognition Finish
True
Recording audio
Recording finish
sending mail
Traceback (most recent call last):
File "d:/cs/emotion/Women safety emotion/comm test.py", line 106, in <module>

```

Fig.10 True Results

```

Go ... ← → Women_safety_emotion
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
2023-05-09 15:00:20.731271: W tensorflow/stream_executor/platform/default/dso_loader.cc:64] Could not load dynamic library 'nvcuda.dll'; dLError: nvcuda.dll not found
2023-05-09 15:00:20.731641: W tensorflow/stream_executor/cuda/cuda_driver.cc:269] failed call to cuInit: UNKNOWN ERROR (303)
2023-05-09 15:00:20.759740: I tensorflow/stream_executor/cuda/cuda_diagnostics.cc:169] retrieving CUDA diagnostic information for host: DESKTOP-H51JQ50
2023-05-09 15:00:20.763635: I tensorflow/stream_executor/cuda/cuda_diagnostics.cc:176] hostname: DESKTOP-H51JQ50
2023-05-09 15:00:20.766911: I tensorflow/core/platform/cpu_feature_guard.cc:151] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library (oneDNN) to use the following CPU
ructions in performance-critical operations: AVX AVX2
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
Running. Press CTRL-C to exit.
COM7 connected!
--> b'13.965425x75.579387\r\n'
["b'13.965425", "75.579387\r\n"]
Latitude : 13.965425
Longitude : 75.579387
[ WARN:1] global C:\Users\runneradmin\AppData\Local\Temp\pip-req-build-t9hleyt8\opencv\modules\videoio\src\cap_msmf.cpp (438) `anonymous-namespace':::~SourceReaderCB::~SourceReaderCB terminatin
ync callback
Running emotion recognition
recognition Finish
false

```

Fig.11 False Results

Emergency help!

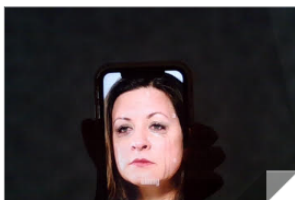


mehroozhama@gmail.com

to mizbanoorainO

Help needed at the location <http://maps.google.com/maps?q=loc:13.965425,75.579387>

One attachment • Scanned by Gmail



Reply Forward

Fig.12 Mail Sent

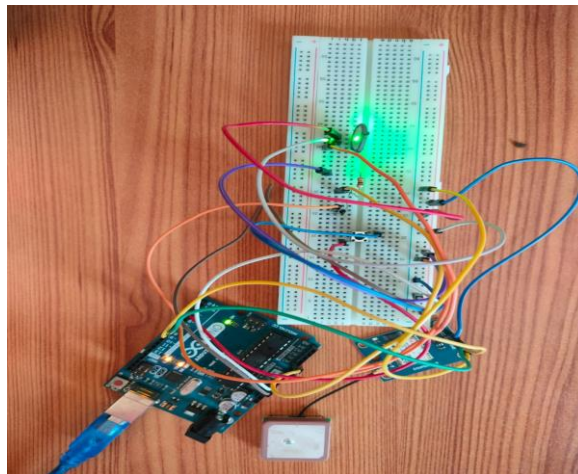


Fig.13 Hardware Components

V.CONCLUSION

The proposed system is developed for the security of a person by making use of wireless sensors and other algorithm. Existing work was only able to alert the authorities with the help of devices in unfavourable conditions but proposed system detects whether the complaint registering is fake or genuine. So this avoids triggering to authorities unnecessarily and hence helps in saving their time. And moreover detection helps to save the innocent one from fake accusations.

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