

DETECTING THE PRESENCE OF HUMAN BEINGS AT SUICIDE SPOT USING IOT AND ANDROID

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ABSTRACT

Over recent years, suicides have proliferated due to work stress and depression. Various types of suicides are done on the basis of a person's mentality. It is an act of intentionally killing oneself by suspending it from the anchor point. New innovations such as Internet of things (IOT), machine learning, deep learning, etc have been used in different safety mechanisms. The IOT is a broad term for connected devices that communicate with other connected devices via embedded sensors and wireless networks, mainly cellular and Wi-Fi. In enduring system uses one PIR sensor module with many well-known machine learning and computer vision methods for analog pattern recognition and movement classification, but it is difficult when compared with a single sensor-based system's performance with multi sensor design and mischance in arriving rate. The proposed system explore to detect the human being at suicide point and notify the rescue team regarding the act using IOT and android application. And provide better outcomes in the identification of suicide attempts in progress compared to traditional approaches.

Keyword : - Internet of Things (IOT), Machine learning, Analog Pattern, Embedded sensors, PIR sensor

1. INTRODUCTION

The Internet of Things (IOT) is the network of physical object-devices, vehicles, buildings and other items which are embedded with electronics, software, sensors and network connectivity, which enables these objects to collect and exchange data. Data capturing is done with the help of sensors connected to the IOT gateways, which collect necessary data and transmit it to the cloud storage. The main objective of this project is to prevent people from committing suicide and to alert the rescue team in order to save people from jumping of cliffs as suicide by young people at the top of their lives is a major concern in India and suicide rates in young adults are rising rapidly. By classifying the direction and distance of a person the simulation results show 99% and 93% respectively. The proposed system reduce the risk of suicide, thus prevents the inadvertent suicide of people who doesn't have any intention of committing suicide. The goal is to prevent the people to get immediate help from the rescue team and remove access to dangerous act.

2. LITERATURE SURVEY

The position and distance of a person is measured in this paper using a PIR sensor [1]. The data collected is trained and validated using different machine learning algorithms. Several studies have shown that the approximate vector-

based classification algorithm obtained better results compared to other classification algorithms. It is difficult to compare the performance of a single sensor-based device with a multi-sensor architecture. When raw data is given directly to non-estimating algorithms, the performance of the assessment is comparatively poor. The importance of the problem is to analyze data from the sensor using machine learning algorithms.

Whenever a person tries to hang himself, the weight is detected and the emergency contact is notified of the act[2]. This is done with the aim of preventing people from committing suicide. The project is designed in such a way that whenever a person tries to hang, the force sensor will sense the set weight, if it is more than the set point weight, the beam will be elongated and will come down. The problem identified in this paper is that the system senses the weight only after a person has placed a rope around his neck, which may delay in reducing the pressure on the person's neck. If no one is present at home when the alarm rings, it becomes a problem. In addition, the alarm is sounded and GSM sends a message to the guardian in question.

Various machine learning algorithms are used to detect hanging attempts in this paper [3]. In order to show the variation in accuracy and sensitivity, different simulated hanging sequences are compared. For the detection of hanging attempts, an innovative technique using machine learning is proposed. After training, the system recognizes the hanging attempts. It captures actions with a camera, generates an alert message. Using this technique, better accuracy and higher sensitivity are achieved in a data set with significant variations between different simulated hanging sequences. The proposed technique shows a higher accuracy and sensitivity of the data set with substantial variations between the different simulated hanging sequences.

A novel approach to tracking the mental health of users on Twitter was developed and evaluated[4]. Researchers focused on interpreting and quantifying suicide warning signs in an online context. In particular, researchers concentrated on detecting distress-related and suicide-related content and developed two approaches to tweet score: an NLP-based approach and a more conventional machine learning text classifier. They were able to detect the true change point for a single validation event, but the method needs to be more reliable in terms of parameter setting and positive speech changes. The authors suggested a deep-seated neural network approach; to identify and monitor children at risk in real time. The model demonstrated impressive results and is capable of identifying and monitoring children at risk in real-life circumstances.

Infants are prone to bullying, accidents and risk and fighting scenarios most of the time[5]. The authors proposed a deep convolutional neural network approach, to detect and track children-in-danger in real time. The model consists of six classes which include bullying, crying, accident, sleeping, risk (handling sharp objects) and fighting scenarios. The model displayed remarkable performance and is capable of performing detection and subsequent tracking of children at risk in real life scene.

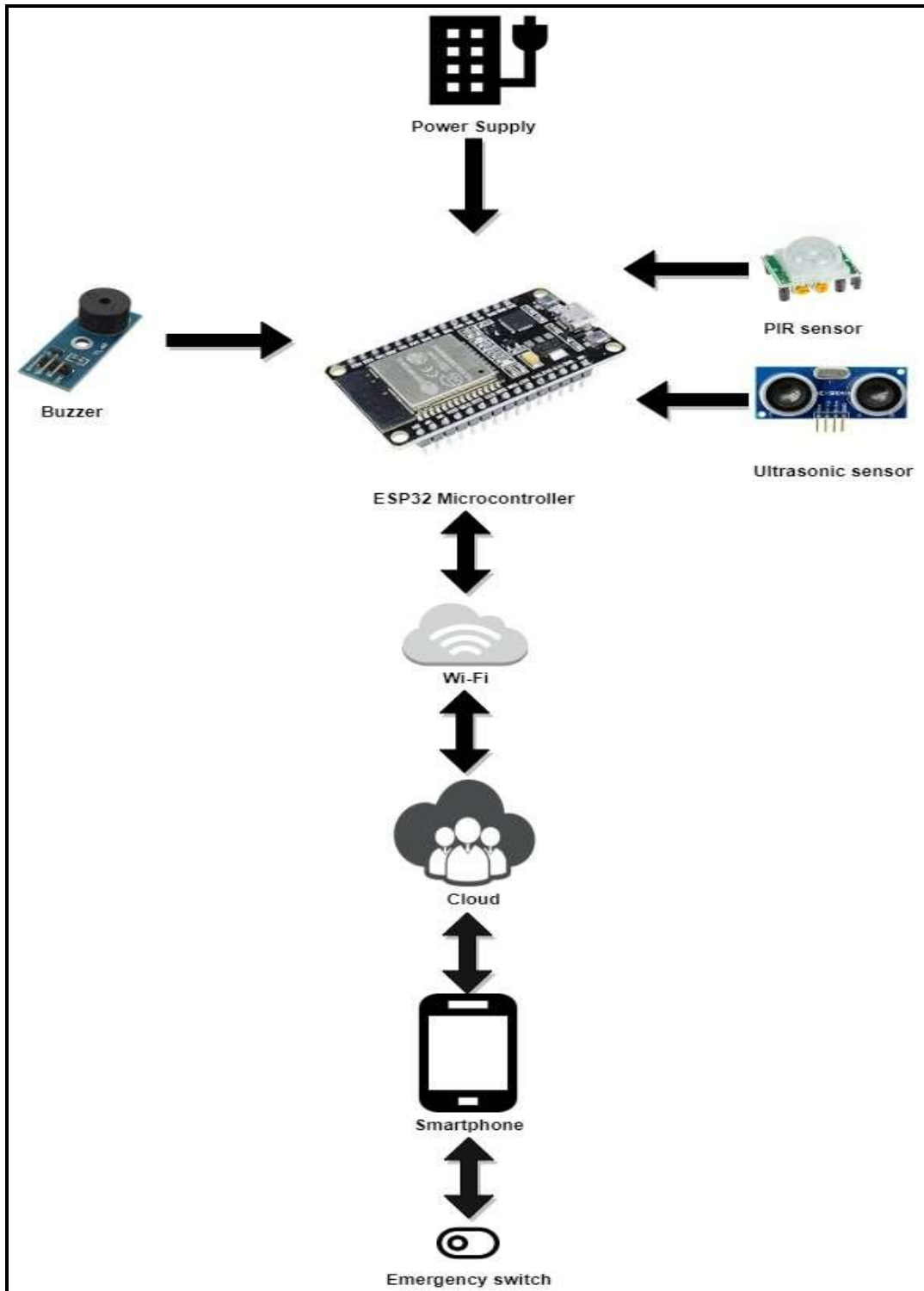


Figure 1: Core Architecture

3. SYSTEM DESIGN

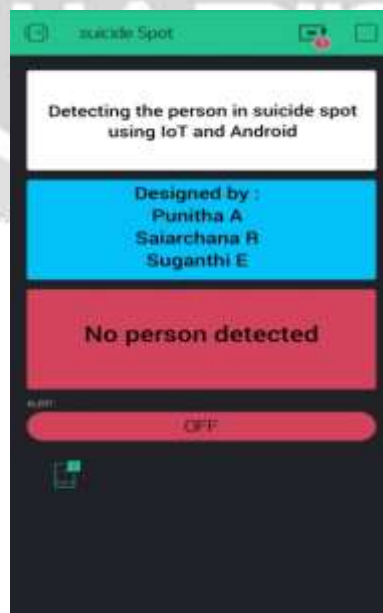
The architecture diagram in Figure1 shows that the PIR sensor is used to detect the presence of a human being at the point of suicide as soon as the person is identified, the ultrasonic sensor measures the distance between the person and the location. The data is then sent to the cloud through which a notification is sent to alert the rescue team about both the person and the distance between the person and the location. The data is stored in cloud which can be used for future use. The notification is sent to the rescue team by the sensors which saves time. The rescue team needn't always monitor the suicide spot. The suicides happening at the suicide spot is reduced. The rescue team is notified about the distance which reduces time consumption in saving the person's life.

4. PROPOSED SYSTEM MODULES

- Sensing the person at suicide point
- Distance Calculation
- Warning the Spot
- Voice-Forewarn
- Alerting the rescue team
- Storing the data

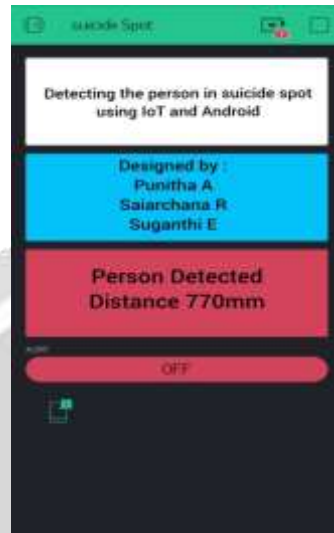
4.1 SENSING THE PERSON AT SUICIDE POINT

The presence of a person at the suicide spot is sensed using the PIR sensor. A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. The detected radiations are converted into an electrical charge, which is proportional to the detected level of the radiation. The PIR sensor detects a human being moving about 10m from the sensor. This is an average value, as the actual detection range is between 5 m and 12 m. PIR are fundamentally made of a Pyro electric sensor, which can detect levels of infrared radiation. Then this charge is further improved by a built in FET and fed to the output pin of the device which becomes applicable to an external circuit for further triggering and amplification of the alarm stages. As soon as the presence of a human being is detected it is sent to the cloud and the rescue is notified.



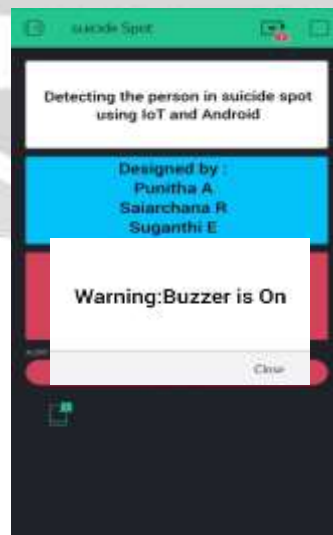
4.2 DISTANCE CALCULATION

To begin measuring the distance, the microcontroller sends a trigger signal to the ultrasonic sensor. When triggered, the ultrasonic sensor generates eight acoustic (ultrasonic) wave bursts and initiates a time counter. When the reflected (echo) signal is received, the timer stops. The output of the ultrasonic sensor is a high pulse with the same duration as the time difference between transmitted ultrasonic bursts and the received echo signal. The calculated distance is then sent to the cloud and also as a notification to the rescue team.



4.3 WARNING THE SPOT

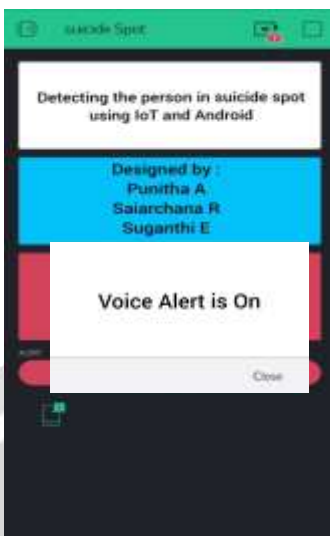
When the human being is sensed then an alarm is sounded to alert the people present at the place. A buzzer is used to produce an alarm. The alarm alerts the people present at the suicide spot regarding the act. The buzzer consists of an outside case with two pins to attach it to power and ground. When current is applied to the buzzer it causes the ceramic disk to contract or expand. Changing this can cause the surrounding disc to vibrate. A buzzer or beeper is an audio signaling system that can be mechanical, electromechanical or piezoelectric (short piece). Typical applications of buzzers and beepers include warning systems, clocks, and user input validation, such as a mouse click or keystroke.



4.4 VOICE-FOREWARN

Voice is one of the most important communication method for human being thus we are using this voice-forewarn to rescue the human being . If a person is detected in the spot the buzzer will alert the people nearby. In additional to

this, voice-forewarn can be used to alert the people automatically and play a recorded audio messages with an audible signal and vibration sent.



4.5 ALERTING THE RESCUE TEAM

In this module, the distance measured between the person and the edge of the cliff is sent to the rescue team via an android application. The rescue team as soon as they receive the notification try to prevent the person from committing suicide. The android application Blynk is a new framework that allows you to easily create interfaces for controlling and monitoring your hardware projects from your iOS and Android devices. Upon installing the Blynk application, you can build a project dashboard and show buttons, sliders, graphs and other widgets on the computer.

4.6 STORING THE DATA

The data that is obtained from the sensors is stored in the cloud that can be used later. This data can be viewed anytime and anywhere through the android application. The sensors capture and send data to be analyzed. Digital devices are virtualized in the IOT environment before data is transmitted to the cloud. Although IOT device can produce a lot of data, cloud computing paves the way for such data to migrate.

4.6.1 DATA STORED

| CASE NO. | DATE | MONTH | YEAR | TIME | DISTANCE | LOCATION |
|----------|------|----------|------|---------|----------|------------|
| 001 | 21 | JUNE | 2017 | 08:51PM | 770mm | KODAIKANAL |
| 002 | 07 | DECEMBER | 2017 | 04:07PM | 551mm | KODAIKANAL |
| 003 | 24 | AUGUST | 2018 | 02:29AM | 612mm | KODAIKANAL |
| 004 | 17 | JANUARY | 2019 | 11:58AM | 1058mm | KODAIKANAL |
| 005 | 02 | MARCH | 2019 | 10:30AM | 957mm | KODAIKANAL |

5. CONCLUSION

Suicide is an act that deliberately causes one's own death. Mental disorders, including depression, bipolar disorder, schizophrenia, personality disorders, anxiety disorders, and drug misuse are also risk factors. Some suicides are impulsive acts due to stress, such as financial difficulties, relationship issues such as breakups or abuse. Many that have previously attempted suicide are at greater risk of potential attempts. The main goal of this project was to deter people from committing suicide and to warn the rescue team in order to save people from jumping of cliffs . The proposed technique shows better accuracy and higher results when compared to the existing system.

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