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# Development of Soldiers Tracking and Health Monitoring System

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**ABSTRACT:** In present Scenario nation's security has come important constraint using war tactics in main factors in any country security. The nation's security is substantially depends on army ( Ground), Navy( Sea), Air Force( Air) of which army dogfaces plays a pivotal part and they're numerous enterprises regarding safety of dogfaces. As soon as any dogfaces enter the war field it's veritably vital for the army base station to know the position as well as the health status of all dogfaces. It's also necessary for the base station to guide a dogface on a current path if he get any problem in the battleground. So we're enforcing an idea of tracking the dogface and to give the health status of the dogface during the war period, which enables the army labor force to plan the war strategies. By using the position transferred by GPS, the base station can understand the position of dogface (latitude and longitude) as well as health parameters transferred by GSM using bio-sensors will give base station an idea about dogface's health.

**KEYWORDS:** Raspberry Pi Pico, GPS, GSM ,Security , Health.

## I. INTRODUCTION

The nation's security is covered and kept by army, cortege and air- force. The important and vital part is of dogfaces who immolate their life for their country. There are numerous enterprises regarding the safety of the dogface. Dogfaces entering the adversary lines frequently lose their lives due to lack of connectivity, it's veritably vital for the army base station to know the position as well as health status of all dogfaces. India has formerly lost so numerous dogfaces in war-fields as there was no proper health backup and connectivity between the dogfaces on the war- fields and the officers at the army base stations.

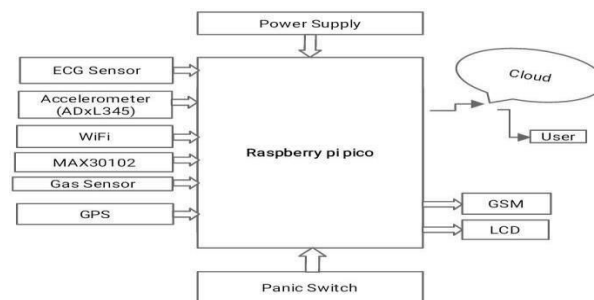
Indian dogfaces are substantially known for their courage, in malignancy of scarce protections and safety measures; they've numerous triumphs to their credits. All must be really concerned about the safety of the dogfaces, so we've decided to make a design which will efficiently keep a check on the health status of the dogface, and his precise position to equip him with necessary medical treatments as soon as possible. For covering the health parameters of dogface we're using memoir medical detectors similar as temperature detector and heart beat detector. An oxygen position detector is used to cover atmospheric oxygen so if there are any climatic changes the dogfaces will be equipped consequently.

So this paper focuses on tracking the position of dogface from GPS, which is useful for control room station to know the exact position of dogface and consequently they will guide them and it's for High speed, short range, soldier to-dogface wireless dispatches to bear information on situational mindfulness with Bio-medical detectors, GPS navigation.



## II.METHODOLOGY

The abnormal movements of the Dogfaces and Critical Positions Faced by the Dogfaces health status and the position of the dogfaces are tracked by “base station”. If the dogfaces are in critical condition we will track the heart beat and temperature of the person as well as the position of the person with the purpose of changing the dogfaces and heal them with separate parameters whenever that person is get defected in war filed if the person press the fear button the alert dispatches is transferred to the base station with the wearing device we can estimate the person is get defected or not while measuring his/ her health parameters then the Block Diagram of Development of Dogfaces Security and Health Monitoring System as shown in Figure .1



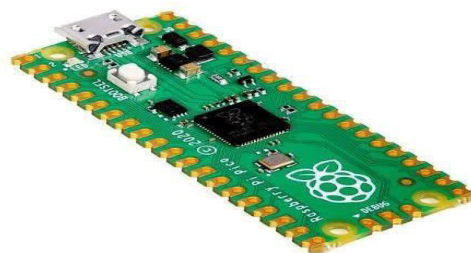
**Fig.1: Block Diagram of Proposed System**

In this design the heart and pulse oximeter detector, temperature detector, gas detector and ECG detector takes the input from the external terrain and this collected information is given to the pico then it can reuse that information and also according to that information affair bias can send the alert dispatches to the stoner through GSM Module and position will be transferred with the help of the GPS Module to the base station.

## III. HARDWARE REQUIREMENTS

### RASPBERRY PI PICO

A Raspberry pi pico is a low cost micro controller device. Micro controllers are tiny devices they tend to lack large volume storage and peripheral devices that you can plug in (ex:- keyboard / monitors). A raspberry pi pico has GPIO pins which means it can be used to control and receive input from a variety of electronics devices.



**Fig 2: Raspberry Pi Pico**

### MAX 30102 HEART RATE OXYGEN PULSE SENSOR

The detector consists of a brace of Light emitting diode which emits monochromatic red light at a wavelength of 660nm and infrared light at a wavelength of 940 nm. These wavelengths are particularly chosen as at this wavelength oxygenated and deoxygenated hemoglobin have veritably different immersion parcels. As shown in the graph below, it can be seen that there's a difference between HbO<sub>2</sub> (oxygenated Hb) and Hb (deoxygenated Hb) when subordinated to these specific wavelengths.



Photo by: ElectroPeak

**Fig.3: MAX30102 Sensor**

**GPS Sensor**

A global positioning system( GPS) is a network of satellites and entering bias used to determine the position of commodity on Earth. Some GPS receivers are so accurate they can establish their position within 1 centimeter. The global positioning system( GPS) is a network of satellites and entering bias used to determine the position of commodity on Earth. Some GPS receivers are so accurate they can establish their position within one centimeter(0.4 elevation). GPS receivers give position in latitude, longitude, and altitude. They also give the accurate time.

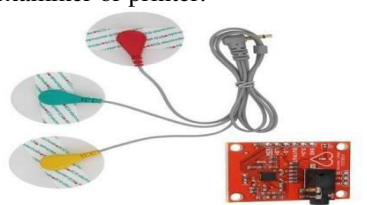


**Fig.4: GPS Sensor**

GPS receivers are programmed to admit information about where each satellite is at any given moment. A GPS receiver determines its own position by measuring the time it takes for a signal to arrive at its position from at least four satellites. Because radio swells travel at a constant speed, the receiver can use the time measures to calculate its distance from each satellite.

**EGG Sensor**

An electrocardiogram( ECG or EKG) records the electrical signal from the heart to check for different heart conditions. Electrodes are placed on the casket to record the heart’s electrical signals, which begetthe heart to beat. The signals are shown as swells on an attached computer examiner or printer.



**Fig.5.ECG Sensor**

An electrocardiogram is a effortless, noninvasive way to help diagnose numerous common heart problems. A health care provider might use an electrocardiogram to determine or descry Irregular heart measures( arrhythmias) If blocked or narrowed highways in the heart( coronary roadway complaint) are causing casket pain or a heart attack Whether you have had a former heart attack How well certain heart complainttreatments, similar as a trendsetter, are working.

**GSM SIM 800L**

The SIM800L is a GSM module from Simcom that gives any microcontroller GSM functionality SIM800L is a atomic cellular module which allows for GPRS transmission, transferring and entering SMS and timber and entering voice





calls. Low cost and small footprint and quadrangle band frequency support make this module perfect result for any design that bear long range connectivity.



**Fig.6: GSM SIM 800L**

#### Node MCU

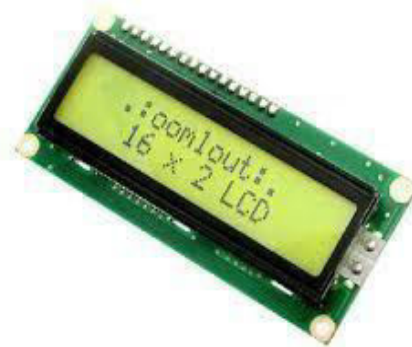
NodeMCU is an open- source LUA grounded firmware developed for the ESP8266 wifi chip. NodeMCU has 128 KB RAM and 4 MB of Flash memory to store data and programs. Its high processing power with in- erected Wi- Fi/ Bluetooth and Deep Sleep Operating features NodeMCU is rested on the Esperessif ESP8266- 12E Wi- Fi System- On- Chip. It's grounded on Lua- grounded firmware and is open- source.



**Fig.7: Node MCU**

#### LCD Display

A 16x2 TV means it can display 16 characters per line and there are 2 similar lines.Liquid demitasse display (TV) has liquid demitasse material squeezed between two wastes of glass Without any voltage applied between transparent electrodes, liquid demitasse motes are aligned in resemblant with the glass face.



**Fig.8: LCD Display**

#### Push Button

Utmost drive button switches function in the same way. Pressure is placed on the button or selector,performing in the depression of the internal spring andconnections and the touching of stable connections at the bottom of the switch. This process will moreover close or open the electrical circuit.



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Fig.9: Push Button

MQ 136

MQ136 Gas Detector monitors the attention of Hydrogen Sulfide gas. This Module detector provides a digital and analog affair. Used to descry a wide variety of feasts like alcohol, bank, methane, LPG, hydrogen, NH3, Benzene,Propane etc.



Fig.10: MQ-136

#### IV.SCHEMATIC

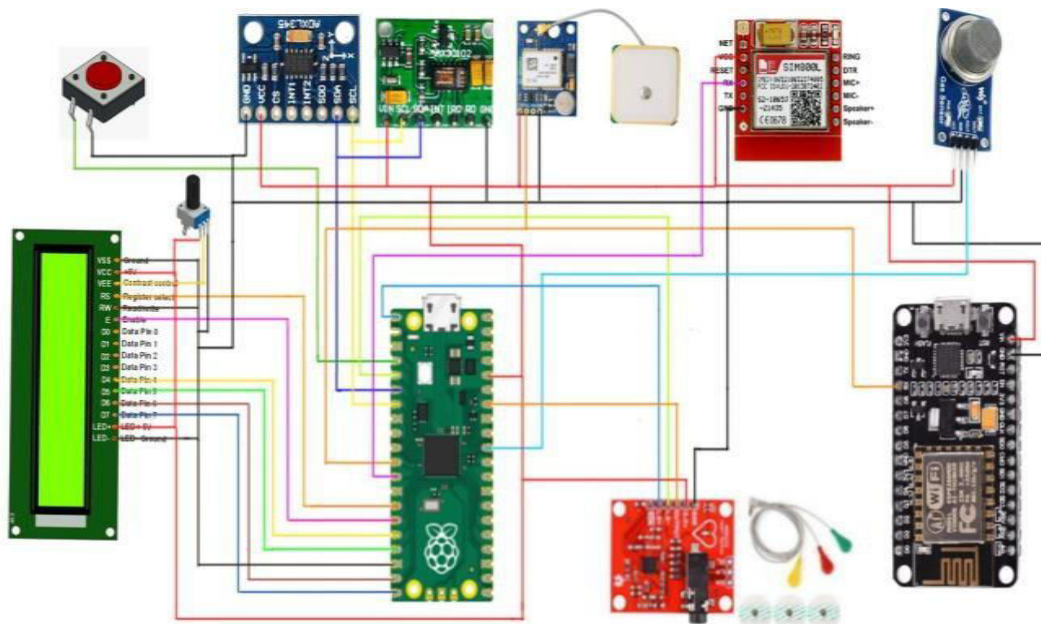


Fig.11: Schematic Diagram

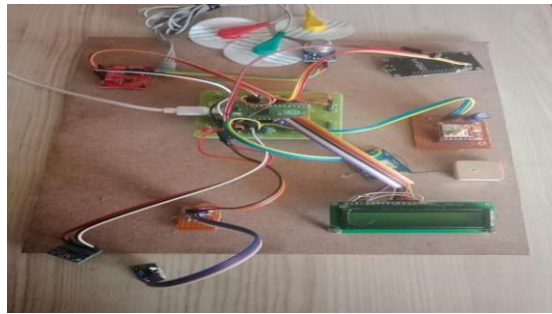
The Raspberry Pi Pico is the primary component used in this circuit. The Raspberry Pi Pico is wired with all of the components. The connections of all the parts to the Raspberry Pi Pico can be seen in the above fig.11.



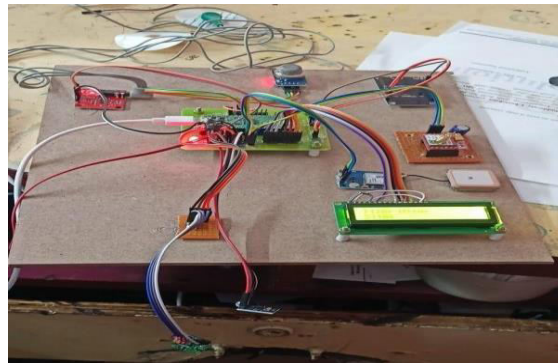
## V. RESULT & CONCLUSION

This project presents Development of Soldiers Security and Health Monitoring System when they are in hazardous situation in the war field .The result shows that higher sensitivity and accuracy is indeed achieved using this project. We made this the project more user friendly, echo friendly and reliable.

The proposed method is verified to be highly beneficial for the tracking the status of the Soldiers. This application provides the optimum solution to the Soldiers in the war tactics We have successfully implemented this project using RASPBERRY PI PICO. In all cases, our technology successfully detected all sorts of danger.The goals of the module will be fulfilled withthe increase in the technology.



**Fig.12: connections without Power supply**



**Fig.13: Connections with Power Supply**

When finger is placed in sensor. The following messages send to predefined telephone numbers Location also will be shared to particular telephone numbers.

Finally, the project was concluded by proposing an idea of Tracking the soldiers health and Security Purposes. It can monitor the health condition of the Soldiers and also gives the intimation regarding hazardous situations. If we use this technology for the Soldiers. It gives atleast one life's to be alive then it is very useful to the base station who are worked for the soldiers tracking them, because we are seeing that so many people are losing theirlife's in the war tactics due to less efficient technology. If we use this technology for the soldiers then it is very useful because soldiers are always at the borders of our country they won't takecare of their health.



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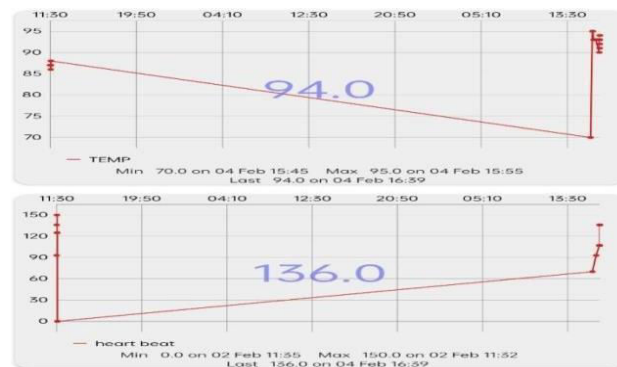


Fig.14: System Status Check in IOT

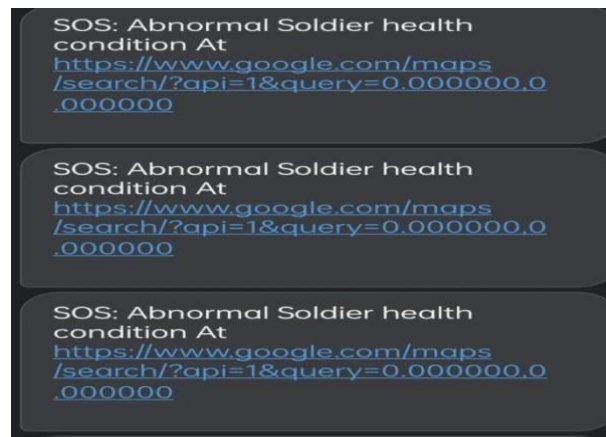


Fig.15: SMS Sent by the System

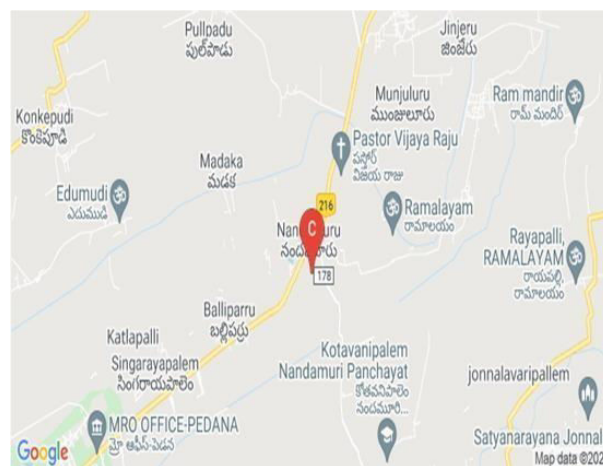


Fig.16: Messages

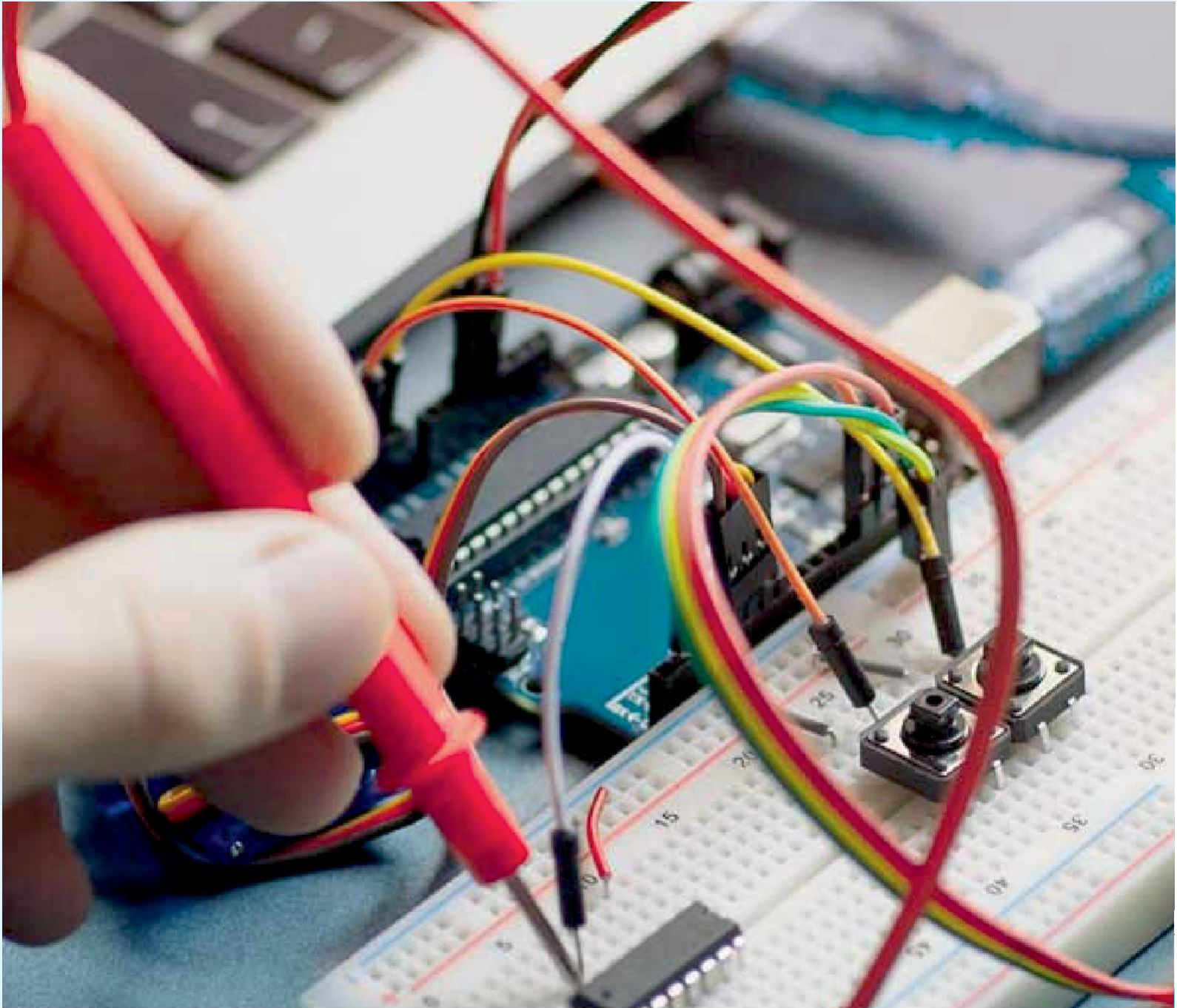
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