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Android Based Wearable Smart Locator Band

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ABSTRACT: A wearable shrewd locator band is an electronic gadget which can be worn on the wrist of the children's to screen and watch out for them. As the quantity of disasters with children's is expanding, it is an absolute necessity to guard them. This likewise helps diminishing crime percentages. The examination study proposed the improvement of a wearable brilliant locator band that assists keeping with following of children. The created gadget incorporates an AVR microcontroller (ATmega8515), worldwide situating system (GPS), worldwide system for versatile (GSM), and exchanging unit and the observing unit remembers Android cell phone for parent's hand with electronic Android application just as area showed on a Google Map. This improvement is extremely valuable for senior individuals and people experiencing memory ailments. This gadget, thus, carries on as a correspondence interface among wearer and parental figure.

KEYWORDS: Android, Locator band, smart wearable band, GPS, GSM connection

I. INTRODUCTION

Wellbeing concern is a significant issue nowadays. Occurrences of abducting, children misuse, lost people, and rowdiness with kids, grown-ups, and matured individuals are expanding step by step. The wearable brilliant locator assists with keeping up an eye on our cherished ones. It has been discovered that 30 million people on the planet are experiencing mental imbalance (mental meltdown), dementia (present moment and long haul memory misfortune), and Alzheimer (loss of cerebrum work). At that point, wearing this gadget helps finding these ailing people in crisis conditions by squeezing crisis catches. It will set off a programmed area guide of the wearer through message and will ring the crisis contacts [1].

Indeed, even this gadget incorporates a virtual range which can be set around a goal by which a notice will be sent to a parental figure's number at whatever point their wearer goes into or leaves it and a LED gleams as a sign in the gadget. This gadget is a ceaseless checking installed utilization of wearer's area, regardless of whether still or moving, and reports the status of that area to parental figure's versatile. The guardian can even converse with the wearer with a two-way calling office, incorporating sound divert in GSM with mouthpiece and speaker which help in calling [2]. It is worn by wearer constantly and doesn't require the individual to work this gadget in any capacity aside from in the event of crisis. This spotlights on better security and wellbeing of people by improving the achievability and unwavering quality of accessible finding gadgets which face hindrances in correspondence and adjusting or subjective execution just as accentuating the relative benefits and impediments of existing innovations. For sure, it tries to increase an improved comprehension of the unpredictable real factors identified with the completing of finding innovation [3].

II. LITERATURE SURVEY

In the previous years, different following/observing systems had been planned and these systems are commonly actualized as childrens or vehicle following systems. The technique for close by individuals in an emergency circumstance with fast requesting. This creation permits a parent to caution others who are available in a fixed sweep. In 2007, Kennedy planned a ready warning which is content informing dependent on the Amber Alert system which helped in children hijacking [4].



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In the year 2005 King and Yancey had given an assault cautioning for vehicle and area plot. Crisis vehicles will find a workable pace by voyaging rapidly and securely and are demonstrated along the guide with a symbol with various visual attributes concerning the situation of the vehicle. At that point Curran et al. proposed a technique in 2012 for characterizing the gadgets going into a 2D geographic zone territory with a client alert. Pankaj and Bhatia in the year 2013 likewise have given their idea to actualize GPS/GSM based vehicle following system and track the vehicle on Google Map and furthermore give the briefest course to arrive at vehicle effectively in negligible time. As these following systems are used for following children or vehicles, this kind of system is in like manner utilized for individuals who are experiencing infections like chemical imbalance, dementia, and Alzheimer and old people [5].

III. DEVICE ARCHITECTURE

Description of Transmission Unit

AVR (ATmega8515).

The ATmega8515 has a place with AVR (upgraded RISC design) family which is a low force (7.5 mW), elite gadget as it works at gem recurrence of 4 MHz and executes incredible directions in a solitary clock cycle (it accomplishes throughputs moving toward 1MIPS per MHz) and In-System Self-Programmable Flash 8-piece microcontroller. It has 512-byte SRAM and 512-byte EEPROM interior recollections. It is too perceived as the focal point of this system. It for the most part functions as an interface between a GPS recipient and GSM module. It has a component of three force sparing modes: inert, shut down, and reserve. This microcontroller starts and sends the wearer's data, message, and voice calling subtleties to cell phone through the GSM chip [6].

GPS Technology.

The GPS depends on a worldwide navigation satellite system to decide speed, position, heading, and time. It uses a heavenly body of 24/32 dynamic satellites in Earth circle that transmit a precise microwave flag and empower GPS beneficiary. A GPS collector needs at any rate three or four satellites to compute the separation make sense of its two measurements, that is, scope and longitude, or three measurements, that is, scope, longitude, and elevation positions.

GSM Technology.

The GSM modem which goes about as a cell phone acknowledges any GSM arrange administrator SIM card with its own one of a kind telephone number. This SIM900A GSM modem can impart and create inserted utilization of SMS based remote control, for instance, to send/get SMS and make/get voice calls.

It can likewise be utilized for information logging application which associates with web with GPRS mode. It is double band 850/1900 MHz which makes it an adaptable attachment and makes it appropriate for long separation information transmission. Its universal meandering ability is a favorable position, with improved battery life and information up to 9600 bps baud rate [7].

1.1.1. Monitoring Unit.

The observing unit incorporates an Android GSM portable with a web plan and an electronic Android application supporting it. The GSM versatile will get a SMS which incorporates the programmed area reference point of the wearer (longitude and scope) and another SMS which incorporates the virtual sweep entering and leaving data.

By opening that SMS it will legitimately interface with the Android application inside a second and open the Google Map with a pointer pointing towards the directions which is the specific current area of the wearer.

IV. HARDWARE DESCRIPTION

This equipment configuration is utilized to find the wearer and help him in the event of need with the assistance of pushbuttons S1, S2, S3, and S4 that even has two-way calling office by utilizing GPS and GSM which are sequentially interfaced with ATmega8515 controller for consistent checking and message sending from the gadget [8].

Switching Unit. It comprises of four switches which are utilized by gadget, that is, shrewd locator band for calling and sending SMS. Four unique tasks are performed by each switch as follows:

S1: for calling the two crisis numbers consistently,

S2: for separating the call,

S3: for noting the approaching call,

S4: for sending SMS of area to both crisis numbers [9].

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- 1.2. *GPS Module.* GPS module which chips away at 3.3 V supply. It consistently faculties the present situation of the wearer and sends it naturally to the microcontroller.
- 1.3. *GSM Module.* GSM module is used for communication, that is, two-way calling that includes dialling, receiving call with the help of microphone and speaker, and sending SMS which contains the current location of the wearer and virtual radius entering and leaving information [10].
- 1.4. *Battery.* When using a combination of GPS with GSM technology, approximately 100 mAh is required. Taking these factors into consideration the rechargeable batteries with the capacity of 7.2 V and 2200 mAh or 4.2 V and 1900 mAh (three in the series) among which one can be used. On an average it can provide a backup of 22 hours a day and it can last up to 2-3 days depending on usage.

V. RESULTS

The controller channels and chooses the approaching one parcel, that is, \$GPRMC from constant six bundles of GPS information, and concentrates the present area of the wearer by sending just the scope and longitude esteems to GSM. It has been discovered that the shadowing and multipath impact because of tall structures in urban gulches or even inside like open shopping centers cause trouble in recognizing the situation of the wearer. To beat this issue an elective methodology is assessed which utilizes the inner memory, that is, SRAM of the Atmega8515 microcontroller, to keep the code information and EEPROM is utilized to spare last substantial position information (up to 20 qualities) in the gadget itself. Along these lines, when the GPS gives the invalid area of the wearer during the time spent persistent position sensation, at that point the last spared area in EEPROM is consequently sent by the gadget on the parental figure side so inexact area of the wearer can be distinguished.

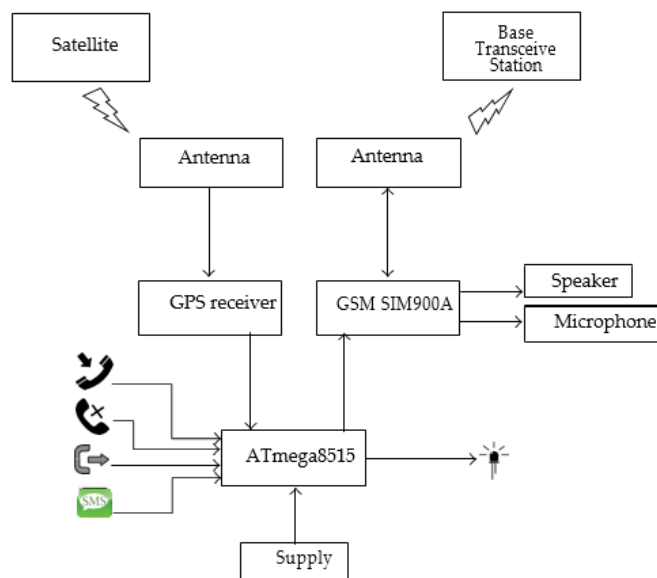


Figure 1: Architecture of transmitting unit.

Ergonomic Study of Wrist Shape.

For planning the wrist band for wearer the accompanying ergonomic structure steps should be followed.

- (1) The size of the wrist lash must be equivalent to the circumference of the wrist of the wearer and is determined by taking estimations of various subjects (at any rate 10), and a normal worth is determined which can be balanced by wearers need.
- (2) The gadget set on the wrist is fit as a fiddle and its measurements need not be more prominent than wrist of the wearer.

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- (3) Four distinctive shading switches are put on the highest point of the gadget for call, separate, get, and message.
 - (4) A receiver and a speaker are likewise accessible on the front board for the wearer correspondence.
- A sweep pointer, on-off switch, and the charging attachment are given on the sides of the gadget.

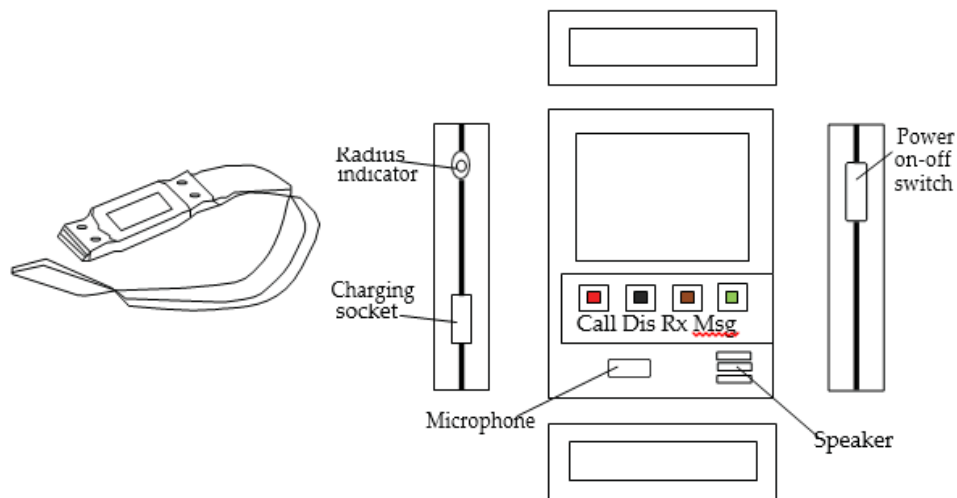


Figure 2: 3D view of smart locator wrist band.

VI. CONCLUSION

Operational and testing aftereffects of model system show that the system worked effectively. On the off chance that this gadget is created into a wrist band, nobody would have the option to assess whether it is a wellbeing locator band or a wrist band/watch. This work is of minimal effort, powerful, and gainful. Be that as it may, there is consistently opportunity to get better. This product has been structured as a model and requires further developments for utilizing it in arranged applications. This system can be additionally used in building up a Windows application which can bolster windows telephone and the wearer gadget must be little and inconspicuous as smaller watch and it ought not name individuals.

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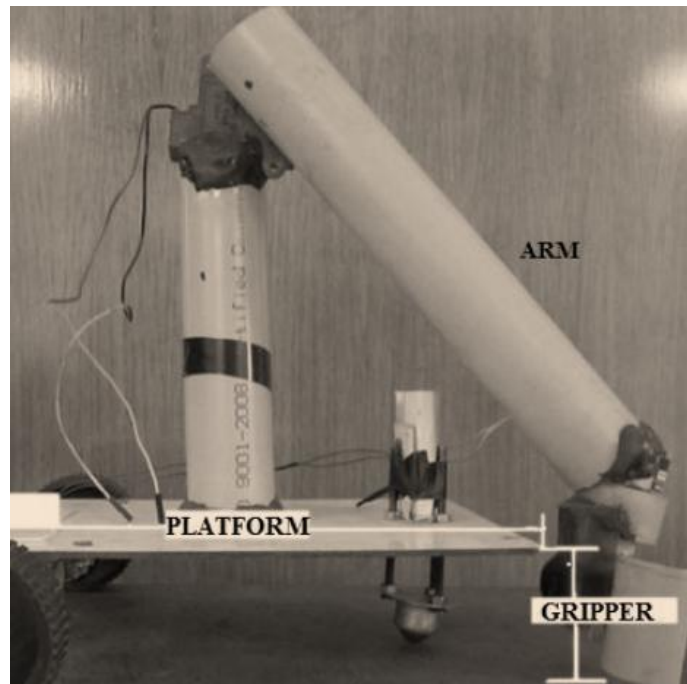


Fig. 2: Robotic Arm

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