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A synopsis on

**Smart Health Care Monitoring System using RaspberryPi2**

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# Introduction

The people suffering from Alzheimer diseases usually forget everything including about their own identify location and their near and dear people. Hence this project proposed a method to help to locate Alzheimer patients when they venture outdoors. Also in the proposed project the Alzheimer patient health is monitored for heart monitoring and body temperature, so this data can be accessed by the android application.

# Motivation

Nowadays GPS and RFID tags are available which can be effectively used to locate devices and people easily. This project proposes one of such method to address the lost Alzheimer patients and inform about their locations to near and dear. Also by tracking the health parameters of patients their well being is monitored and timely action can be taken.

**Problem of Statement**

* Many older people forget someone’s name or misplace things from time to time. This kind of forgetfulness is normal.
* But, forgetting how to get home, getting confused in places a person knows well, or asking questions over and over can be signs of a more serious problem.
* The person may have Alzheimer’s disease. It is a disease of the brain that begins slowly and gets worse over time.
* What is the current Heart Rate, temperature is difficult to monitor manually for this type of person.

# Objective(s) and Scope

This method proposes to locate Alzheimer patients using RFID tags and GPS data. For this we propose a prototype of an autonomous and wireless system combining the two technologies that enables getting information’s about the position of Alzheimer patient from the intelligent tag, also warn about his absence. The body parameters like heart beating and body temperature are monitored and reported to doctor and relatives regularly.

**Real-time locating systems (RTLS)** are used to automatically identify and track the location of objects or people in real time, usually within a building or other contained area. Wireless RTLS tags are attached to objects or worn by people, and in most RTLS, fixed reference points receive wireless signals from tags to determine their location. Examples of real-time locating systems include tracking automobiles through an assembly line, or finding medical equipment in a hospital.

The physical layer of RTLS technology is usually some form of [radio frequency](https://en.wikipedia.org/wiki/Radio_frequency) (RF) communication, but some systems use optical (usually [infrared](https://en.wikipedia.org/wiki/Infrared)) or acoustic (usually [ultrasound](https://en.wikipedia.org/wiki/Ultrasound)) technology instead of or in addition to RF. Tags and fixed reference points can be transmitters, receivers, or both, resulting in numerous possible technology combinations.

**What is a real-time location system?**

A real-time location system (RTLS) is one of a number of technologies that detects the current [geo location](http://searchmobilecomputing.techtarget.com/definition/geolocation) of a target, which may be anything from a vehicle to an item in a manufacturing plant to a person. RTLS-capable products are used in an ever-increasing number of sectors including supply chain management ([SCM](http://searchmanufacturingerp.techtarget.com/definition/supply-chain-management)), health care, the military, retail, recreation, and postal and courier services.

RTLS is typically embedded in a product, such as a [mobile phone](http://searchmobilecomputing.techtarget.com/definition/cellular-telephone) or a navigational system. Most such systems consist of wireless [node](http://searchnetworking.techtarget.com/definition/node)s -- typically tags or badges -- that emit signals and readers that receive those signals. Current real-time location systems are based on wireless technologies, such as [Wi-Fi](http://searchmobilecomputing.techtarget.com/definition/Wi-Fi), [Bluetooth](http://searchmobilecomputing.techtarget.com/definition/Bluetooth), ultra wideband, [RFID](http://searchmanufacturingerp.techtarget.com/definition/RFID), and [GPS](http://searchmobilecomputing.techtarget.com/definition/Global-Positioning-System).

# Description of the proposed project work/ Methodology

The concept is to attach an intelligent tag to the Alzheimer patient, and insert the reader in the exit. In the case he tried to go out, his tag will be read and a message of warning will be send to the person in charge who can get all the information’s from the GPS module in the tag. Accordingly, the Alzheimer patient can be followed because of its location that is already known.

If the Alzheimer patient is not in indoor we switch to the GPS, turn it on and begin tracking. The RFID and GPS are attached to the asset for tracking and the position of the asset is recorded at regular intervals. The recorded location data can be stored within a tracking unit, or it may be transmitted to a central location data base, or internet-connected computer, using cellular (GPRS or SMS) modem embedded in the unit. This allows the asset’s location to be displayed in real time.

The temperature sensor attached to the body of the patient will record the body temperature periodically and send to the main receiver controller. The controller will display the temperature along with time in which reading is taken.

In the same way the heart monitor will track the heart beating and report same to controller regularly. In case of abnormal reading are recorded then the controller will detect the same display them in different color to high light the emergency situation the patient is facing. Since controller data is with family or with doctor, timely action on patient is taken and problem is averted.

Controller and Thread creation

RFID Receiver

GPS Reader

RFID Tag

GPS Unit

Display

Micro controller based Wearable device

Heart Monitor

BP Monitor

Temperature Monitor

Main Receiver

RFID Reader

GPS Receiver

**Advantages of the proposed System:**

We are able to track the patient along with his/her current health status like as heart monitoring & temperature which play a key factor in our life.

# Hardware & Software Components

* 1. **Hardware** 
     1. Raspberry Pi 2 - 1
     2. GPS trans receivers -2
     3. RFIDs -2
     4. Heart rate monitoring sensor
     5. Temperature monitoring sensor
     6. Keyboard
     7. Mouse
  2. **Software**
     1. Linux 2.6
     2. C, C++
     3. Amazon (AWS) services
     4. Shell script
     5. Drivers for GPS, RFID

1. **Conclusion**

We presented an approach for Alzheimer patient tracking using the RFID tags and the GPS. We presented a system allowing having the relative position of the tag.

Additionally we described how we can locate using the advantage of each technology. We furthermore present how to fabricate both of the elements: the tag and the reader. Finally, in practical our system can at the same time detect and build accurate maps sending data continually, otherwise knowing the position in real-time of people with Alzheimer disease.

We are monitoring temperature, heart beat continuously .Based on the threshold value sms goes to family member and doctor along with location also.

# Future Scope

Further this functionality can be extended to monitor various other parameter of the patient by including other sensors.