

# VLSI Design for Human Health Monitoring and Medical Alert System Based on FPGA, MEMS and Special Sensor Network

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**Abstract:** The main aim of this paper is to monitor the health conditions of elders and patients. The system checks the health condition of one through smart sensor network, MEMS module and GPS/GSM technology. The system monitors the health condition of the human being daily. The interface used is user-friendly it monitors the health conditions of a human being. Also it sends information to the nearby hospital if something goes wrong with the patient. This device can be worn by anyone as it is light weight or compact. It also provides the exact location of the patient to his/her family which provides some relief to their family too. By this system the patient can be travel anywhere he/she wants as the system monitors the conditions each and every time. So even if something goes wrong the system informs the nearby hospitals and also to the family. Thus this device also makes the patient independent.

**Keywords:** GPRS- General packet radio service, GPS-Global Positioning System, GSM- Global System for Mobile, MEMS-Micro Electro Mechanical Systems.

## I. INTRODUCTION

This paper is primarily used to screen and personal the physical wellbeing states of elderly individuals or patients. Here the framework identifies the anomalous wellbeing condition (e.g. circulatory strain, beat rate and fall identification) by utilizing the shrewd sensor system, MEMS and GPS/GSM technology. The detecting gadgets can be sorted as reduced gadget. This can be effortlessly connected to body, for example, heart beat sensor, weight sensor, accelerometer and whirligig. This gadget will watching the physical state of elderly individuals or patients in individual conditions, for example, home, working environment, and restroom has extremely significance since they may be unassisted in these areas. By and large elderly individuals or patients have constrained physical capacities and are more powerless against genuine physical harms even with minor mischances, e.g. fall. Generally falls are eccentric and certain. All things considered the fall can be early perceivable additionally we can incite the warning to crisis administrations is fundamental for snappy recuperation. Here we propose another fall location framework which can be effortlessly wearable to the general population. Likewise give both the open to wearing and low calculation overhead. This is resemble an accessory molded gadget. This module

incorporates tri-hub accelerometer and gyator and extraordinary sensors to group the wellbeing condition and stance of the identification subject. With the assistance of GPS/GSM following framework we can ready to distinguish the correct area where the individual has tumbled to the ground and it used to caution relatives, closest nursing home or other individuals whodeal with the elderly People. Likewise it will send data to the nursing home and relative's whether they fallen or wiped out. At that point the fitting move can be made quickly so we are utilizing these exceptional sensors units. Through easy to use interface.

## II. PROBLEM STATEMENT

- Observing the general population is to be manual task
- Correspondence between nursing/relative is poor.

## III. PROPOSED METHODOLOGY

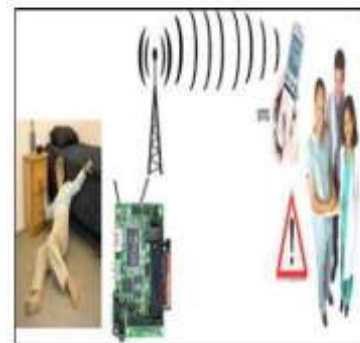


Figure: 1 Proposed method

In this paper a fall identification and physical wellbeing observing framework is proposed with a gadget comprising of tri-hub accelerometer, spinner and exceptional sensor organize (i.e. weight sensor, pulse sensor and MEMS) which are created as a neckband. This is principally used to observing the physical wellbeing states of elderly individuals or patients. Here the framework distinguishes the anomalous wellbeing condition (e.g. circulatory strain, beat rate and fall detection).it will send data to the nursing home and relative's whether they fallen ordebilited. At that point we can make

proper move promptly. Likewise so the nursing home and relative can get the correct area of the individual fall on the earth as longitude and scope.

#### IV. ADVANTAGES

- Detect Abnormal Situation.
- Patients/Elder’s safety can be assured.
- Easily find the location.
- We can take immediate action.

#### V. BLOCK DIAGRAM

##### 5.1 Transmitter Section

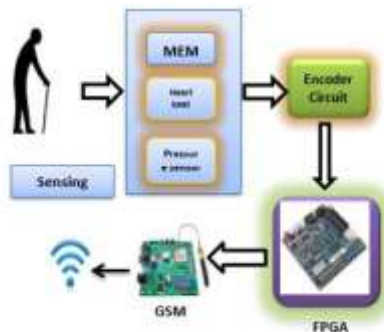


Figure2: Block diagram of Transmitter Section

##### 5.2 Server Section

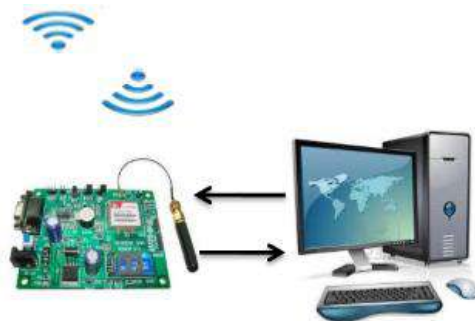


Figure3: Block diagram of server section

##### 5.3 Block Diagram Description:

Figure.2 demonstrates the proposed arrangement of this task comprise of exceptional sensor organize (i.e. Weight sensor, Heart beat sensor, MEMS and GPS/GSM Modules) associated with the FPGA (Field Programmable Gate Array).In this framework the Pressure sensor is utilized to quantify the pulse, Heart beat sensor is utilized to ascertain the heart beat esteems and MEMS (Micro Electro Mechanical System) is utilized to discover the Fall recognition of the People. Utilizing these uncommon sensor system and MEMS we can locate the unusual wellbeing state of the general population. Furthermore, we can undoubtedly discover the area utilizing

GPS as scope and longitude. Once the gadget identifies the fall or weakness state of the general population.

FPGA will get the scope and longitude from the GPS module and furthermore send the data to the server segment as scope and longitude esteems. By utilizing GSM Technology. Figure.3 server segment comprises of GSM (Global System for Mobile) module and Data base unit. In information base unit we need to keep up the individual detail of the general population who having our wellbeing observing gadget. Here the GSM is associated with the PC (Personal PC) here we can locate the worldwide area by getting the scope, longitude esteems from GPS. And it will send data to the nursing home and relative's whether they fallen or wiped out After finding the correct area, we can give the data to relatives or other individuals who deal with the patients/elderly People. At that point we can make proper move quickly.

#### VI. APPLICATIONS

Automatic health monitoring and fall detection

- Easily Detect the person who is in Abnormal Situation
- Monitor if the elder/patients moves away from the place of residence using GPS tracking. Easily find the location
- Patients/Elder’s safety can be assured.
- Reliability, Easy usage
- Immediate Action -Fast First aid or medical treatment can be guaranteed.

#### VII. CONCLUSIONS

In this paper, we proposed an easy to understand interface sensor organize comprising of heart beat, weight sensor, accelerometer and gyrotator. Here we utilized straightforward calculation to discover fall identification and irregular wellbeing condition. Our proposed fall location framework can be viewed as elective gadget to the current recognition approaches, since the gadget gives the happy with wearing and quick identification reaction. These favourable position highlights are gotten by giving up the affectability of the falls/wellbeing condition utilizing exceptional sensor arrange.

#### VIII. FUTURE SCOPE

For the future work, we intend to actualize a vitality proficient medium access control (MAC) convention into our littler measured sensor organize for the information unwavering quality and to build up another kind of handheld gadget.

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