



e-ISSN: 2278-8875
p-ISSN: 2320-3765

International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

Volume 11, Issue 6, June 2022

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.18

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Elderly Fall Detection and Alert System

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ABSTRACT: Falling which is commonly found in many people it mostly happens in elderly sometimes falls even result to death there are more than 27.7 lakh deaths in India which only occurred due to fall till 2020 if we can provide immediate intimation to emergency contacts and near and dear ones so we will be able to reduce the risk factor .We proposed a System using node MCU in which whenever a fall has been detected ADXL sensor detects the fall through Blynk app and mail we can send an alert message that fall is detected that alert message also contains location where the fall is detected.This location is extracted from GPS module

KEYWORDS: Falling, node MCU, ADXL sensor, GPS module

I. INTRODUCTION

Falling is an act that takes place in a person which results in loss of steadiness and ends up at a lower position often on the ground it is one of the major reasons of death and common point for injury especially in elderly. Fall in elderly always leads to several health issues number of persons above age of 60 years is growing fastly especially in India there are 76.6

Falls are one of the major problem in elderly and are considered as “geriatricgiants”.There was a review study which was carried out on falls in India named accidental falls in India and a report on this review was published called national report on falls which stated that falls are major reason for 3.3 % of deaths in India

WHO stated that falls are the major secondary cause of accidental injury deaths worldwide adults who are aged above 65 mainly suffer with fatal falls quality of life of these people can be improved using fall detection system

several kinds of fall identification techniques have deployed one among them is fall detection cameras they help to provide continuous and reliable fall detection many hospitals and care organizations are installing these cameras these cameras use ai technology and whenever someone has fallen over they raise an alarmthese camera based methods are helpful only in indoor environment but they are not preferable for outdoor applications.

The elderly makes a big and important part of our society. The percentage of the elderly increased in the past few years and will continue to increase to reach 30% of the world population by 2150 as per the predictions of the United Nations (according to the medium scenario) . It is essential that we implement smart solutions for elderly care; this can be achieved with the assistance of technologyAccording to the rapid increase of the elderly a health care provider are needed . In order to provide crisis care for the elderly must find out the reasons that they may face and health-threatening . Falling is one of the most common and dangerous accidents for elderly people Anda-significant factor affecting the living quality of the elderly that reduce the independence of the person . The falls and the falls related injuries are the most important challenge for the elderly healthspecifically who are living alone. Many elders fall and sustain aninjury sometimesremain on the floor for long durations until someone discoversthem, so it isimportant to recognize them as early as possible and provide assistance.We proposed a System using node MCU in which whenever a fall has been detected ADXL sensor detects the fall through Blynk app and mail we can send an alert message that fall is detected that alert message also contains location where the fall is detected. This location is extracted from GPS module

II.LITERATURE SURVEY

1.Nirmala B.Joshi,S.L.nabalwar

Proposed system in this paper is Iot based camera technology .As many of the elderly are living alone there is no one to take care of them so by this system the picture which is recorded from camera is analyzed using algorithm and email will be sent if a fall has been detected



2. Arkham Zahiri Rahman; Kurnianingsih; Lakita Edi Nugroho; Wadhawan
This paper presents a prototype of ubiquitous fall detection and alert system in smart home environment (u-Fast) using smartphone. This system works with smart home environment
3. Messam Safar Zadeh; Yusef Alborzi; Ali Najafi Ardkeen
This system presents a fast approach for detection of falls and sensing SMS. Networks called as MLP classifier and poster estimation are employed. This system contains dataset of landmarks of body of different postures and using MLP we analyze these postures and intimates if fall is detected
4. Chemanol Nadeem; Kosan Chinghai
In this ultrasonic based multi sensors are used. The ultrasonic technology-based multi sensors are couple of receiver and transmitter together, which are connected to Arduino in order to send the elderly person's fall related signal using WIFI to the processing unit.
5. Dima Litvak; Yaniv Zigel; Israel Ganot
This system has developed a unique and inexpensive solution for fall detection. The solution is based on floor vibration and acoustic sensing, and uses a pattern recognition algorithm to discriminate between human or inanimate object fall events. This procedure is implemented at high end apartments
6. Joseph Santiago; Eric Catto; Luis G. Jaime's; Idolizes Vergara-Laurens
This paper presents a system which monitors an older adult. This system mainly has 2 components a wearable device and a cell phone. The wearable device has the capability of communicating with a cell phone which is located in a range of 100m radius. Once, the wearable device detects a fall, it sends an alert to the cell phone; then the cell phone alerts to the emergency contacts defined by the user

III. PROPOSED SYSTEM

In this project we designed a circuit that helps to identify the fall detection using adxl sensor and after the fall is detected a alert message is displayed in Blynk app. That message contains the location where the fall has been detected. Location is extracted using GPS module.

This paper outlines the implementation the system which helps in the detection of a fall and the notification of the required persons via an SMS containing the location of the fallen person, so as to provide timely medical attention.

BLOCK DIAGRAM

The Block Diagram of this System consists of:

- Power supply
- Node MCU
- ADXL sensor
- Blynk iot app
- Mail

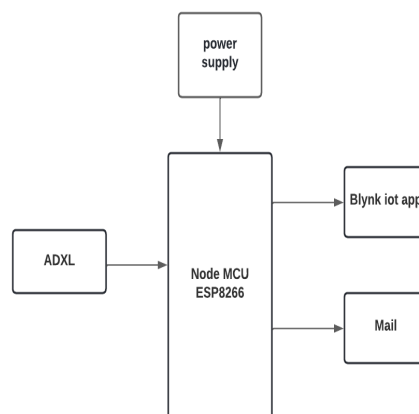


Figure 1: Block diagram of Elderly Fall detection and Alert system



Arduino UNO is the main component of the system. Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board. ADXL sensor acts as input. After our sensor gets activated message will be sent to Blynk app that message contains the location which is extracted from GPS module.

FLOWCHART

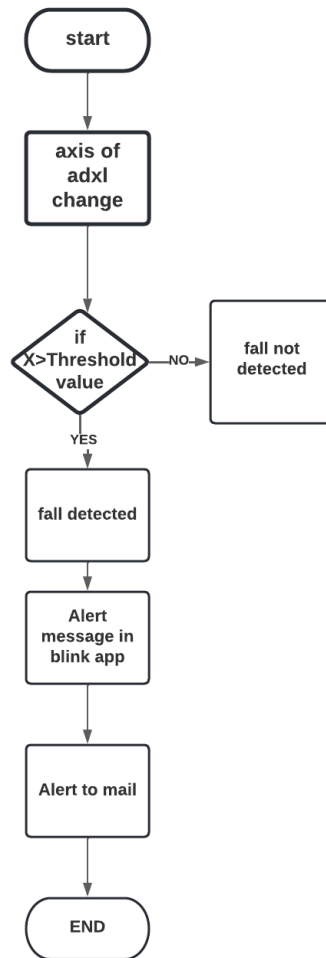


Figure 2: Flowchart of Elderly Fall detection And Alert System

Firstly power supply is given to the system ADXL sensor has 3 axis called X,Y,Z axis X represents the height particular threshold values will be given to all 3 axis .if the value of x axis go's beyond our threshold value we can tell that fall has been detected. After fall has been detected alert will be send to Blynk app and Mail



IV.RESULTS

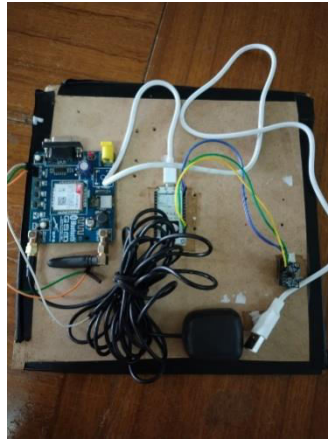


Figure 3: Prototype of the design

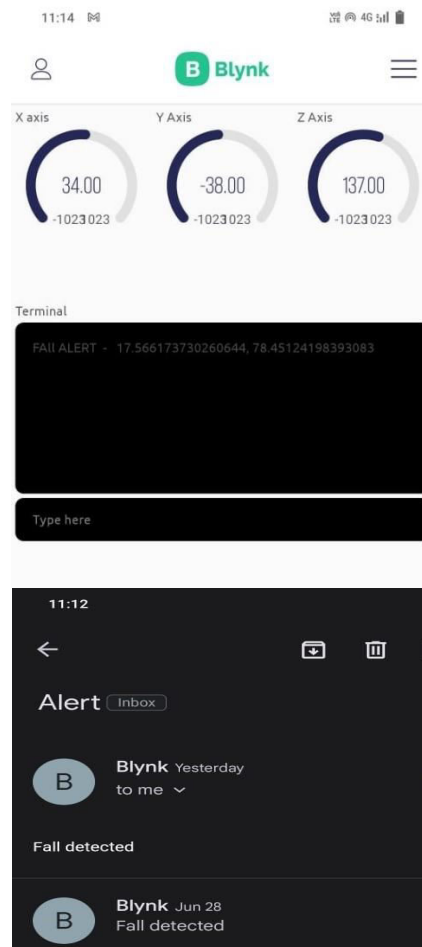


Figure 4: Alert notification through the Blynk app

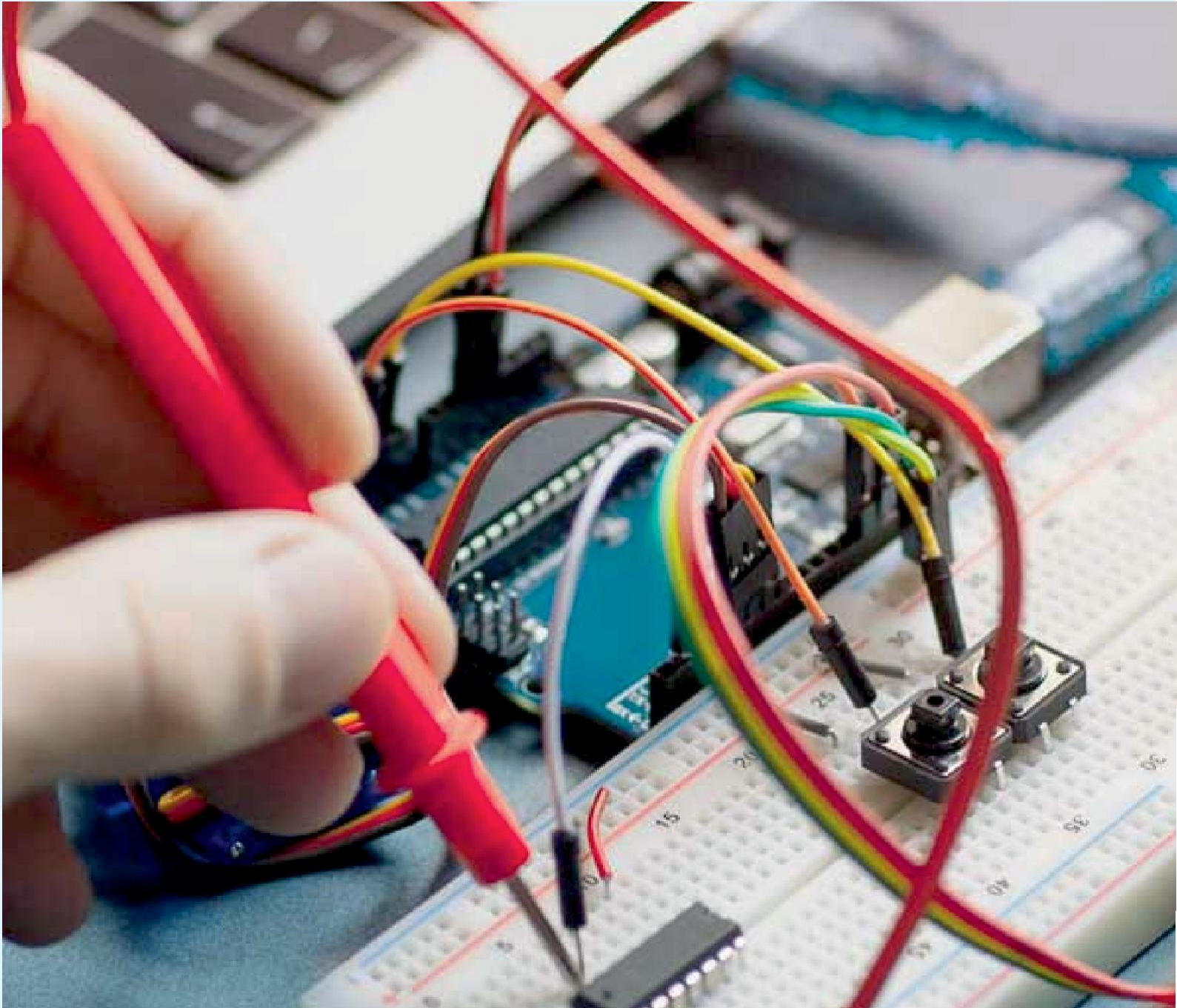


V.CONCLUSION AND FUTURE SCOPE

Elderly are pride to the nation but they face many problems as their age grow's and major problem they face are due to falls. Falls not only reduce strength but also it reduces stability of the person .so we tried to provide solution for this problem which is "Elderly fall detection and alert system". By this we might able to reduce the risk factor in many cases.

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