Study of Swift Rescue System using GSM

Hadpe Nilesh Valmik, Avhad Vaishnavi Jagannath, Sangale Gaurav Govinda,
Wakchaure Abhishek Sanjay, Gorle Ganesh Sanjay
Department of Electrical Engineering
Amrutvahini College of Engineering, Sangamner, India

Abstract*: Deaths due to road accidents growing day by day & it becomes open challenge to all over world. This paper will introduce an automated accident response system connected with new technologies compose of sensors communication devices like GPS, GSM module etc. A GPS & GSM module in the model vehicle will minimize time of ambulance to reach hospital & save the lives. Sensors used in this project are types of proximity sensors they senses accident sends signal to the microcontroller. Embedded 'C' programming is used to assembly of components. Mini car having this module will show the architecture of project.*

Keywords: Swift rescue, Communication system, Emergency Services, Central Control

I. INTRODUCTION

The Swift Rescue System is a groundbreaking project that leverages GSM technology to create a roboustand efficient emergency response system in times of crisis the system ensures swift assistance by integrating GPS and GSM modules, allowing precise location tracking and communication with emergency services.This innovative solution aims to enhance response times and save lives by providing real time information to first responders. A pioneering approach to coordinating and deploying emergency medical services, especially in instances of road accidents.

By harnessing the capabilities of the Arduino microcontroller and seamlessly integrating the ADXL345 accelerometer, the system introduces a fresh perspective on accident detection, seamless communication, and real time tracking Central to system' functionality is the vehicles acceleration and deceleration patterns. In the unfortunate event of an accident ,the accelerometer promptly triggers the emergency response protocol.

OBJECTIVE

- Rapid Response: Enable swift and timely response to emergency situations through real-time communication via GSM.
- Location Tracking: implement GPS or GSM based location tracking to quickly identify the precise location of individuals in distress.
- Communication Relay: Estabilish a reliable communication channel between those in need of rescue and the rescue team using GSM technology.
- Automated Alerts: Set up automated alert systems to notify emergency services and relevant authorities immediately upon detecting an emergency situation.
- Integration With Emergency Services: Facilitate seamless integration with emergency services, allowing for a coordinated and efficient response.

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II. DESIGN METHODOLOGY
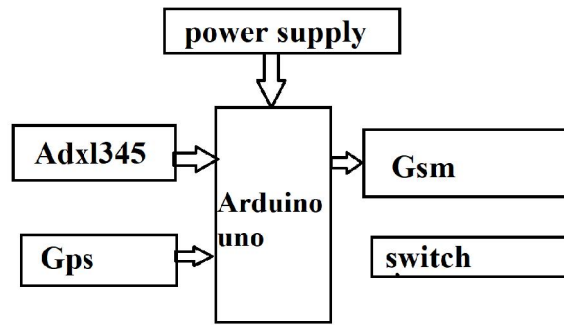
III. SYSTEM DESIGN

The system works as follows:

1. Arduino Microcontroller:

Arduino microcontroller act as the system's brain. Arduino microcontroller board is type of ATmega328P chip. Because of its easy use it is so much favourite of users. Any programming language can be usein microcontroller. It is very much versatile can be use in any kind of projects. There is a large active community of Arduino users around the world. The Arduino is one of the most affordable microcontroller boards on the market

2. Proximity Sensor:

Detection of nearby object is happen with the help of proximity sensors. They are used in most of application including ultrasonic sensors. These ultrasonic sensors are sound waves for the detection of presence of object. They can be used to detect object at longer range than other types of proximity sensors.

3. Battery:

A 6 volt battery supply is a common type of power source used in various electronic devices and applications. Here are some of the most common types of 6-volt batteries. Lithium ion batteries-These are light weight rechargeable batteries used in wide range. Some 6 volt lithium ion batteries are also available

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4. GSM:GSM means Global system for mobile communication. GSM is standards developed in Europe to define how mobile devices like phones and tablets communicate on second generation (2G) digital cellular networks.

GSM was the first widely adopted digital cellular technology and it's still used in many parts of the world today, although it's being phased out in newer, faster technologies like 3G and 4G.

5. GPS: GPS Meansglobal positioning system. It shows time and location details at anywhere. It is owned and operated by the U.S space force: While developed for military use, GPS is freely available for civilian use.
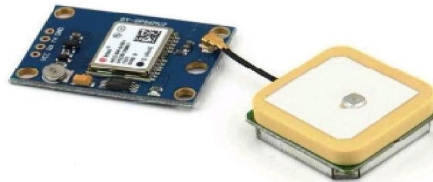
It includes the constellation of satellites, Wave reception, Position calculation, Global coverage and free access. GPS works anywhere on land with an unobstructed view of the sky and doesn't require any subscription fees. Beyond basic location services, GPS is used in various applications, including:

Navigation: providing accurate data for creating and using maps

Mapping: Providing accurate data for creating and using maps

Emergency services: Enabling faster response times for emergency personnel.

Precision agriculture: Guiding tractors and other equipment for efficient farming practices.

Overall, GPS is a powerful tool that has revolutionized navigation and location based services worldwide.

6. ADXL345:
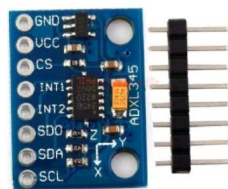
ADXL345 is a popular choice for a variety of applications due to its size, ease of use, and versatility.

It is the accelerometer sensor which detects the tilting of car

7. Power Supply: In practical work vehicles battery is use as the power supply
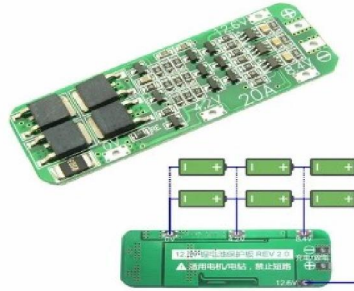
In project model, 6 volt battery is used which provides power for running the assembled model.
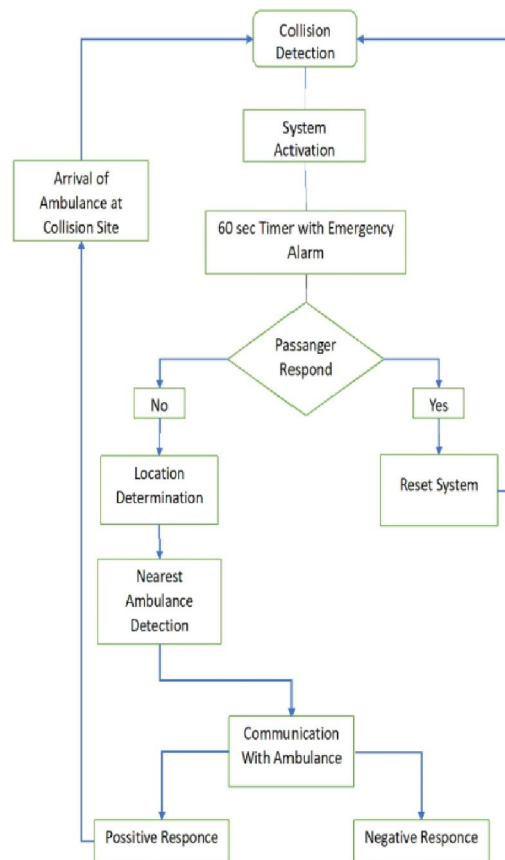
8. DC Motor (diy):

DC motor is use to forcefully running the car.

9. BMS:

Battery management system manages the temperature of battery. By closing or opening of various valves battery manages the temperature within limited range.

Fig.1:BLOCK DIAGRAM

IV. ADVANTAGES

- Real-time Location Tracking: GSM allows for real time tracking of the rescue device,enabling swift and accurate location updates during emergency situations.
- Two Way Communication: GSM enables two way communication between the rescue device and the monitoring center, facilitating coordination and information exchange during rescue operations.
- Wide Coverage: GSM networks provide extensive coverage,ensuring that the rescue system can function in various geographical locations, including remote areas.

- Quick Response: The use of GSM-technology allows for rapid communication between the rescue device and emergency responders,leading to quicker response times in critical situations.
- Cost-Effective: Implementing a rescue system using existing GSM infrastructure can be cost-effective vompared to building a proprietary communication network.
- Accessibility: GSM technology is widely accessible, making it easier for individuals to use the rescue system without the need for specialized equipment or knowledge.
- Integration with Emergency Services: The GSM-based rescue system can be integrated with exisiting emergency services, enhancing overall coordination and collaboration during rescue missions.
- User-Friendly: The simplicity of GSM technology makes the rescue system user-friendly, ensuring that individuals in distress can easily use and benefit from the system.
- Reliability: GSM networks are known for their relilability, providing a stable communication platform for the rescue system to operate effectively.
- Scalability: The GSM-based rescue system can be easily scaled to accommodate a larger user base or expanede coverage, making it adaptable to changing needs and circumstances.

V. CONCLUSION

In conclusion, the Swift Rescue System utilizing GSM technology presents a robust and efficient solution for timely emergency responses. By integrating GSM communication, this project ensures swift and reliable communication between the rescue team and those in distress. The real-time tracking and alert features enhance the overall effectiveness of the rescue process, contributing to a safer and more responsive emergency management system. As technology contineues to evolve, this project lays a foundation for future advancements in swift and reliable rescue system.

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