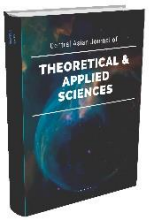


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# AI Based Drone Escort Ambulance Service System in Heavy Traffic

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***Abstract:*** *Every year 20% of emergency patient death is blamed on traffic jam delays. More than 50% of heart attack cases reach the hospital late. The major problem is that no one is responding until ambulance reaches them, it became a hard time for an ambulance to reach its destination. To avoid such situations, most of the European countries introduced "Police motorcycle Escorts" for clearing the way. To accomplish this, we propose Drones which are designed by neural network that travel through streets of city safely. It is designed as a fast residual network of eight layers, two outputs are produced by the drones for each single input image drone navigates using a steering angle while avoiding obstacles, and dangerous situations are recognized by a collision probability to let the UAV take action accordingly. Deployment in urban environments has so far been limited to certain extent.*

***Keywords:*** *Artificial Intelligence, Drones, Neural Network, Accident rescue System, UAV navigation.*

## Introduction

The lifesaving minutes after an occurrence of an accident is very critical and it is much needed to provide emergency care to prevent life of humans. Speeding up the emergency medical services is important to prevent deaths and screw up the recovery immediately. This is significantly true for drowning, heart failure, traumas and other respiratory issues. Lifesaving medical aids can be carried and services can be provided inspite of heavy traffic.

Automation is about, using robots or materialistic components instead of human. We use artificial intelligence in these components or robots to work as like humans. Because of heavy traffic in urban areas, it's impossible for ambulances to reach the destination in a short period. Most of the European countries use police escorts to clear the way for ambulance[4].Instead of using human energy or effort it's better to use the technology. We use the technology in the form of drones with Artificial Intelligence.

The main aim of our work is to make use of technology instead of human effort. Death rate due to delay of ambulance can be decreased. Reducing the travelling time as much as by providing right(clear) way for the ambulance. Not only at the signals, throughout the way by which ambulance goes. Collecting the data accurately and efficiently can achieve in providing the service. This system can be used to avoid the obstacles and collisions. Being able to successfully navigate while avoiding obstacles, is indeed crucial to

 

unlock many robotics applications.Alerting the vehicles is done using signals and voice commands. Death rate can be decreased which causes due to traffic delay. Drones can be used instead of Police escorts.Using AI for Drone controlling and avoid obstacles gives higher efficiency. Using AI technology more ,reduces human effort.

## Methodology

We arrange a set(3-4) of drones for an ambulance. Each drone has a different states(p1,p2,h,g,etc..) to work according the scenario in figure 1.P1- It alerts or indicates the vehicle to clear the way or to give space.P2- It finalize, whether the way is cleared in between P1 and ambulance as shown in fig 1. Else it informs or warns the vehicle to give the way ,if required it takes snaps of the vehicle plates. H- It halts the vehicles using red signal, where there are no signal points. It will wait for other drone to replaces its state or it can be used as a backup.

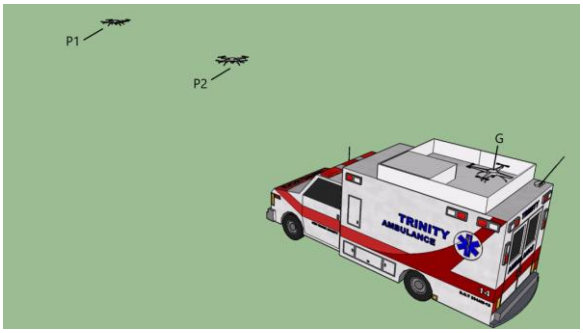


**Fig1. Drone Ambulance**

## Path finding and Navigation

UAV navigating through the streets successfully should be able to promptly react to dangerous situations as it follows the roadway as well . Therefore, we herein propose to use data collected from ground vehicles which are already integrated in environments as fore mentioned. Overall, this work makes the following contributions as shown in fig.2

Fig 2.(a) Outdoor 1 (b)outdoor 2 (c) Outdoor 3

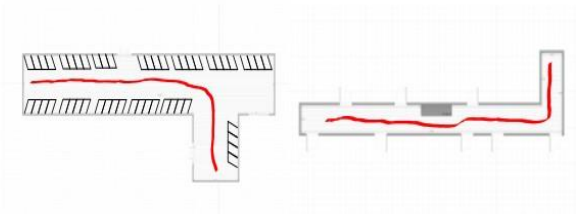

Fig 3. (a)Model A (b)Model B

 

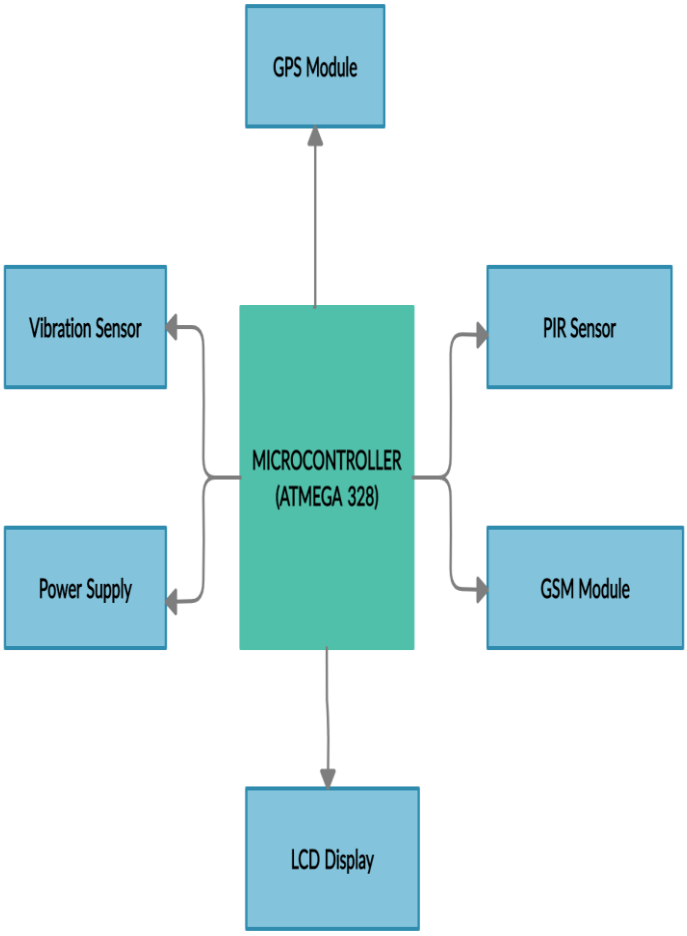


**Fig 4.Block diagram**

**Description of Modules**

**ATMEGA328 Microcontroller**

AVR RISC-based microcontroller which 8-bit combines 32 KB ISP flash memory with-read –write capabilities. The above has the configuration 1KB EEPROM,32 general purpose registers, timers with compare nodes which are flexible. Internal and external interrupts.it operates between 1.8-5.5 volts.

**GPS Module**

GSM is abbreviated as Global System for Mobile Communication. For transmitting mobile and voice data services it is the digitalized cellular technology used.

GPS is a specially designed unit for tracking the navigation of mobile objects and find its location.

**Vibration sensor**

For measuring and analyzing the linear velocity, displacement and proximity and acceleration vibration sensors are used**.**

 

**PIR Sensor**

It stands for passive infrared sensor (PIR sensor) which is an electronic sensor that measures infrared (IR) light that is radiating from objects in its field of view. It is mostly used in PIR-based motion detectors.

**LCD Display**

The sensor values like airbag releasing , person status are displayed using this.

**Messaging Protocol—TWILIO**

It is a cloud based communication system which uses (PaaS) platform as a Service in collision intelligent system. It serves from San Francisco, California. It allows techies to programmatically receive and make calls, text messages and communicate al functions using its web service API.

**WORKING**

The complete model of this accident detection and information passing method uses the above steps as shown in figure 4. GPS is used to detect the latitude and Longitude ,and a text message is sent to rescue team through GSM. Using EEPROM the message receiver number is pre-stored.

It is also provided with an option to avoid false messages. Piezo an electronic device, generates voltage ,when it is deformed physically by vibration, mechanical strain and sound wave.

It vibrates and creates a tone when a voltage passes across piezo, which is used to detect and play tones. Tracking and navigation is done by GPS .The vehicle is tracked without the intervention of the manual systems. Using this system on time emergency medical services can be provided to the accident victims who are injured, and their life can be saved. Particularly people living in Urban areas could not get immediate medical help due to heavy traffic, even if the patients are travelling in their own vehicle, so these drones can be used efficiently by employing artificial intelligence Technique to detect the exact location of accident spot and provide the medical services. Not only accidents this is also useful in case of emergency situations like Stroke Attack, Heart Attack, and other diseases where immediate treatment is needed. People can be saved in the Golden Hours with being much affected by the attacks.

**EXPERIMENTAL RESULTS**

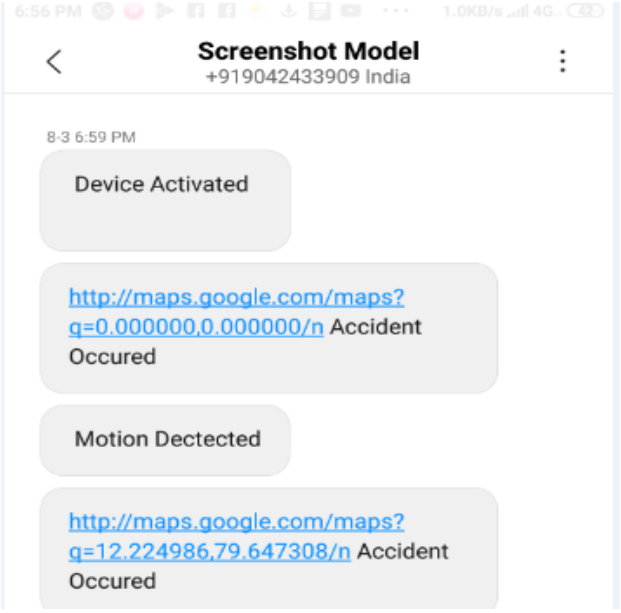


**Fig.5 Location of occurrence of accident**

## CONCLUSION

In the proposed work ,when a vehicle meets with an accident, and after accident if there is no movement in the car or by the people in the car ,automatically the vehicle number and person details will be transferred to police control room and rescue team. So using GPS system the rescue team can easily locate the location where accident have occurred and send rescue assistance team immediately to the spot. GSM technology is employed to achieve wireless communication. The get more optimal results about the accident, sensors are used. This system can also be used in automatic traffic monitoring and estimation of traffic. Tracking of collision can be done intelligently and loss of life can be prevented well in advance.

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