PROJECT PROPOSAL

Department of Information Technology

Project Idea 2

Title: Intelligent Accident Management System using IoT and Cloud Computing

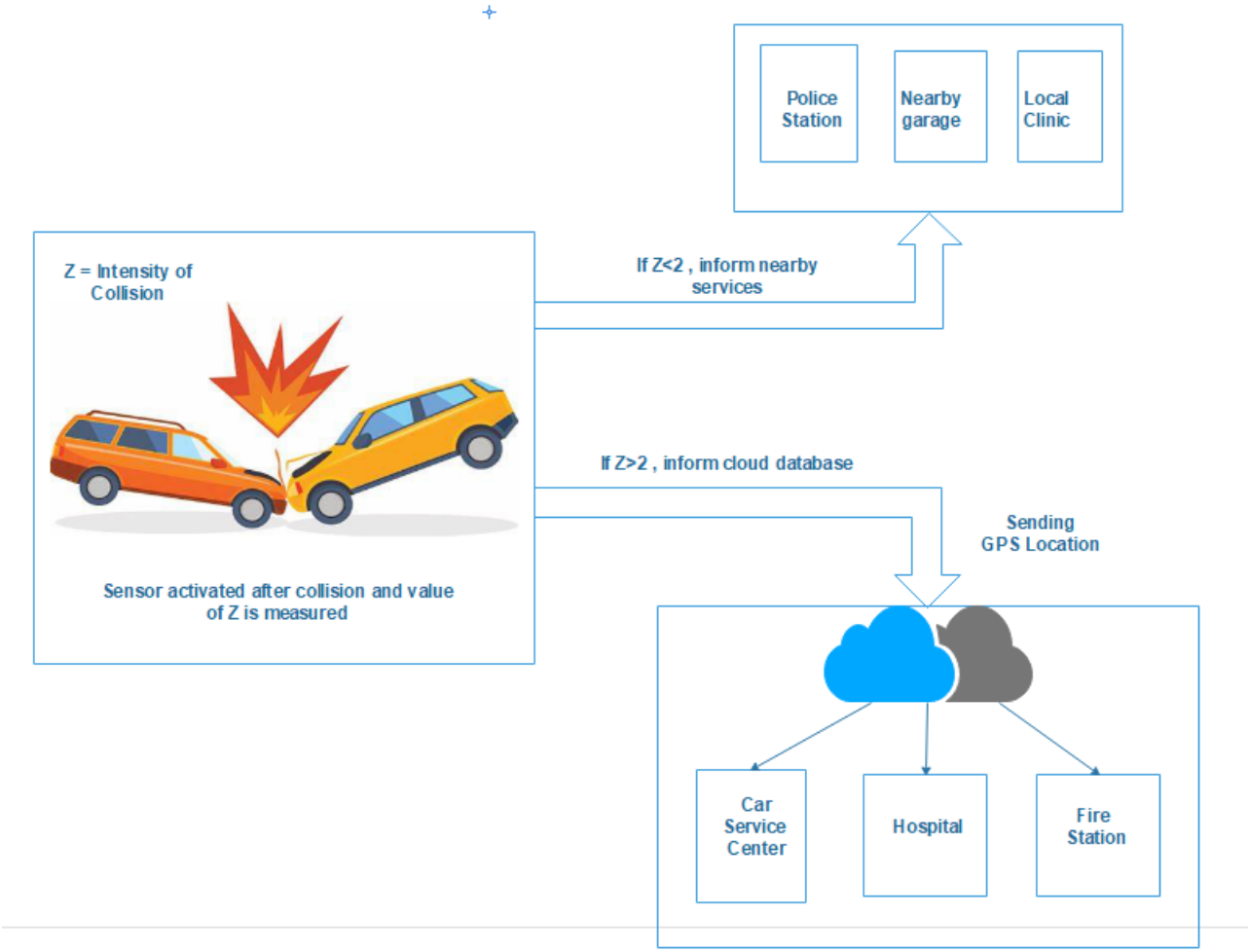
Introduction:

Vehicular accidents are one of the leading causes of fatalities across the world. Survival rate depends largely on the time in between the accident and when emergency responders arrive or are dispatched to the scene. One way to reduce the delay between accident and emergency response is to use in-vehicle automatic accident detection and notification systems. These in-vehicle accident detection systems are typically available in luxury/expensive vehicles. In several low-end cars especially in developing countries such accident detection systems are not installed by OEMs. In this project, we attempt to address this problem by proposing an automatic accident detection system based on IoT sensors and Cloud Computing. In case of accident, there will be some collision in the vehicle which will be sensed by the crash sensors. These crash sensors will measure and report the intensity of collision based on certain parameters and operations related to the automotive design of the vehicle. This strength of collision mapped on a scale will then inform the respective nearby sensors in IoT which can come out to help the victims. In case of lighter collision, only the local car repairs and other nearby sensors forming an IoT network will be informed. In case of high intensity collision, the data relating to location of car and other things will be sent to cloud which will then inform the nearby car repairing showroom, hospital services and the repairing services.

Brief Description:

With the ever increasing population, the number of vehicles on road are increasing exponentially. As a result,the number of car accidents resulting in fatalities is also increasing. Survival rate depends largely on the time between the accident and when emergency responders arrive or are dispatched to the scene. For instance, if a crash takes place in a fairly crowded area, the bypassers usually comfort the victim ,give him/her first aid and then call for an ambulance. The ambulance then arrives on the scene and admits the victim to the hospital. In case of an accident in a secluded area, there's a high possibility that no pedestrian in present in order to call for an ambulance at all! In the above two cases, a lot of precious time is wasted which might have actually helped in saving the victim's life if utilized correctly. In order to tackle this problem , we propose a model which can be deployed conveniently anytime , anywhere.
Any accident is detected or accompanied by some kind of collisions. By measuring the intensity of these collisions, we can detect how harsh the accident is. For example, if a smaller collision is detected we can easily judge that the vehicle has experienced just a small dent or puncture. Whereas on the other hand, if the collision detected is of larger momentum then we can judge that a large amount of loss is incurred in terms of human lives as well as in terms of vehicle damage. Information about a major collision is thus sent to the cloud server which then becomes responsible for gathering help. omes responsible for gathering help. In our model, the collision and its intensity is measured and the corresponding value is generated let it be 'z'. The value of z is mapped on a scale ranging from 1 to 4. If the value of z is less than 2, we need not inform the cloud server about it. We can easily inform the nearby sensors about the event thereby leveraging the concept of IoT to gather help. If the value of z is greater than 2, then we can assume that a major loss has occurred and a higher level help is required. The cloud server is informed about the collision where the database of cloud server is searched for appropriate people and the requests are generated to other helping agents like ambulance, car agency, hospital etc.

Diagramatic Representation:



Technology Integration:

Arduino IDE will be used for coding the microcontroller – NodeMCU.
Javascript , PHP will be used for server side coding and cloud computing.

Scope of The Project:

With this project we aim to decrease the number of car crash fatalities. This is done by reducing the amount of time from when the car crash occurs till the time any help arrives. On successfully implementing the project a lot of lives will be saved especially of those involved in a car crash in a secluded area where there is very little help available.

Literature Base Paper:

1. https://ieeexplore.ieee.org/document/7877395
   Intelligent accident management system using IoT and cloud computing
   Akriti Singhal ; Sarishma ; Ravi Tomar \
   October,2016

2. https://ieeexplore.ieee.org/document/7800181
   S-CarCrash: Real-time crash detection analysis and emergency alert using smartphone
   Harit Sharma ; Ravi Kanth Reddy ; Archana Karthik
   September, 2016

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