Intelligent vehicle to vehicle communication & surveillance system using IoT.

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Abstract - Technological approaches for detecting and monitoring fatigue levels of driver fatigue continue to emerge and lots of at the moment are within the development, validation checking out, or early implementation phases. Prior studies have reviewed on hand fatigue detection and prediction technologies and methodologies. As the name indicates this assignment is about developed applied sciences in cars for making it extra sensible and interactive for heading off accidents on roads. Via making use of hardware kit this system becomes extra effective, riskless & effective. There are very much less number of techniques carried out on human behavior detection in or with automobiles. In this paper, we describe a real-time on-line security prototype that controls the car velocity below driver fatigue. The reason of any such mannequin is to enhance a method to detect fatigue signs in drivers and manipulate the speed of car to hinder accidents. The foremost add-ons of the procedure include number of actual time sensors like fuel, eye blink, alcohol, gas, influence sensors and a program interface with GPS and Google Maps APIs for region.

Keywords: GPS ,Accident,Vehicle,Speed,Fatigue,Security

I. INTRODUCTION

In the recent years, the vehicle communication technology has gained the popularity in industrial field. By the use of V2P (vehicle to person) communication and V2V (vehicle to vehicle) communication they can be used for the purpose of Serving safety and security. The concept of vehicle communication is in existence due to the accidents caused because of human error or by lack of concentration on road while driving or by applying sudden brake on front vehicle on Roads. With the vehicle communication onboard the vehicle theft will reduce significantly because owner can reach the vehicle location simply through the help of vehicle communication. Nowadays, wireless communication technologies are applied in different areas of daily life. Vehicles are being equipped with wireless communication devices, enabling them to communicate with other cars, and with centralized systems by using road-side infrastructure nodes. These communications offer new opportunities for developing new applications for vehicles. By using this technology, the automotive industry is able to improve transportation systems efficiently. In vehicular environments, wireless technologies enable peer-to-peer mobile communications among vehicles (V2V), as well as communications.

II. TECHNOLGY IMPLEMENTED

A. WIFI

Wi-Fi technology is standard wireless based technology designed for a specific needs for very low cost. It is very suitable for high level communication protocols. Wi-Fi is also known as WPAN (wireless personal area network). Wi-Fi can be used to set small communication network in an area. Wi-Fi is based on IEEE 802.11 standard technology. Wi-Fi is like Bluetooth technology whose area of communication is up to 20 meters with line of sight communication with low power consumption. Wi-Fi communication range can be increased up to 1000 meters with high power consumption. Wi-Fi work on 2.4-5.0 GHz radio frequency to transport the reliable and easy to use standard between vehicles and infrastructures (V2I) across the world.

B. GPS

Global positioning system (GPS) is a network of satellites that transmit data, which can be used to identify precise location on earth by calculating the distance from twenty four satellites. The position of an object is accumulating by four or more satellites line of sight and in order to provide errorless location with the help of GPS satellites which moves around the earth twice a day. GPS are of two type 2D in which only three satellites are required to provide latitude and longitude and other is 3D, for which four or more satellites are require to provide altitude also.

III. WORKING ALGORITHM

1.KNN
2.KMEANS

KNN

Knn is an algorithm that classifies the all stored available cases based on some similarity attribute e.g. Distance function. It's been used in pattern recognition and statistical estimation from 1970. Majority vote of neighbors are used to classify case, which uses distance function to assign case to most common amongst its K near neighbors. If k>0 and K<2 then case is assigned directly to that neighbor.

Distance functions

Euclidean $\sqrt{\sum_{i=1}^{k}(x_i - y_i)^2}$

Manhattan $\sum_{i=1}^{k}|x_i - y_i|$

Minkowski $\left(\sum_{i=1}^{k}(|x_i - y_i|)^q\right)^{1/q}$

Hamming distance is used in case of categorical variables. Above described distance calculation is generally used and valid in case of continuous variable.

Algorithm

Step 1: Determining K value. Use cross validation if necessary.

Step 2: Use any distance function available if data in continuous manner if not use hammer function.

Step 3: Sort the distance matrix for nearest value determination.

Step 4: Generate all categories of training dataset, since its supervised learning for the sorted value which fall under K

5. Predict result of majority of K value.

2. **K Means Algorithm:**

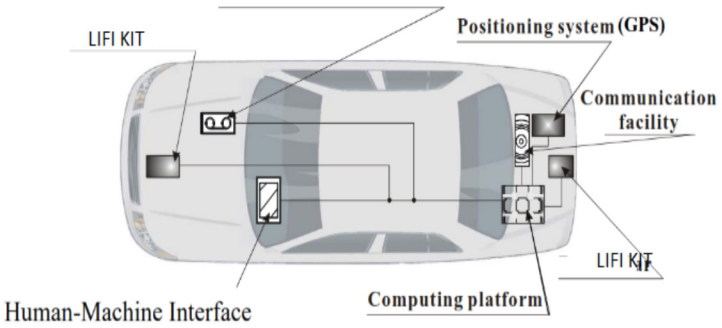
K-means (Macqueen, 1967) is one of the simplest unsupervised learning algorithms that solve the well-known clustering problem. The procedure follows a simple and easy way to classify a given data set through a certain number of clusters (assume k clusters) fixed a priori. The main idea is to define k centroids, one for each cluster. These centroids should be placed in a cunning way because of different location causes different result. So, the better choice is to place them as much as possible far away from each other.

The next step is to take each point belonging to a given data set and associate it to the nearest centroid. When no point is pending, the first step is completed and an early group age is done. At this point we need to re-calculate k new centroids as barycenter's of the clusters resulting from the previous step. After we have these k new centroids, a new binding has to be done between the same data set points and the nearest new centroid. A loop has been generated. As a result of this loop we may notice that the k centroids change their location step by step until no more changes are done. In other words, centroids do not move any more.

Steps:

1. Place K points into the space represented by the objects that are being clustered. These points represent initial group centroids.
2. Assign each object to the group that has the closest centroid.
3. When all objects have been assigned, recalculate the positions of the K centroids.
4. Repeat Steps 2 and 3 until the centroids no longer move. This produces a separation of the objects into groups from which the metric to be minimized can be calculated.

IV System Architecture



V Goals and Objectives

Goal **-** To develop a smart system that can track the vehicle, and implementing advanced technologies in cars for making it more intelligent and interactive for avoiding accidents on roads.
Objective **-** Intelligent systems are in used with every aspect of systems, CARs are the critical systems which are real time and lives are involved. This System not only deals with component monitoring, does even more than that like Passenger activity monitoring, Behavior analysis, System behavior, Notification& co-ordinate.

VI CONCLUSION:

It is due to the driving force's fatigue; visitor's accidents keep with every year increasing of an excessive expense. This paper shows the new fatigue detection algorithms & procedures utilizing affect, fuel, etc. Sensors. On this process the fatigue will be detected right away and common traps the pursuit's driver through study presented in this paper, we advise a sensible automobile method for accident prevention and making the sector much better and secure location too live.

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