Smart Driving License Issuing Test for Smart City

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ABSTRACT

To prevent illegal licenses and therefore causing accidents, a new automated system is proposed. This system can be implemented using Bayesian logic classification algorithm and feature extraction algorithm. The proposed system need to design the wireless sensor network and also the multi sensor fusion based detection approach for detecting result. The map management is also needed to compare the test data from Global Positioning System with reference data & also manipulate speed of the vehicle. Mapping and multi fusion sensor combination transmission is done using remote server. The Bayesian classification algorithm is implemented with data mining for result. GPRS is used as a gateway. The proposed system is the elimination process of existing process to issue Indian driving license. For this the applicant will be allotted the test vehicle for test drive with the number of sensors connected embedded in vehicle sending data using wireless sensor network to remote server to get processed. Result analysis is done by comparing the received data with previous data.
Keywords: GPS, Data Mining, Map Matching, Multi Sensor Fusion –Based Detection Approach, GPRS module.

I. INTRODUCTION

A driving license is an official document certifying that the holder is suitably qualified to drive a motor vehicle. One person is dying in road accident in every 30 seconds because of ineligible drivers with illegal license. 30% of Indian driving population have a fraudulent License according to 2015-16 reports of the Transport Ministry. So it is very important to disassociate the driving ability test from the licensing authority.

The proposed work is thus the elimination process of existing scenario to issue Indian driving license. For this the applicant will be allotted the test vehicle for test drive with the number of sensors connected embedded in vehicle sending data using wireless sensor network to remote server to get processed. Result analysis is done by comparing the received data with previous data. Bayesian algorithm is used for decision making by comparing data from sensors. The sensors used are Gyro sensor to define coordinates in terms of longitude and latitude of a test vehicle. While RPM sensor is used to sense and measure speed at every angle of test vehicle. Wireless sensor network includes Global Positioning System (GPS) and GSM/GPRS device. GPS provide data for mapping, receives X, Y, Z coordinates according to position of a vehicle. GSM/GPRS is used as a gateway.

Map management includes map matching using grey scale and pattern matching. Data mining is used to filter data & the camera is used for monitoring. The Software required for proposed work is, .Net for visual data, while MS ACESS for back end application. The software is designed for front end and back end separately.

II. Research Methodology

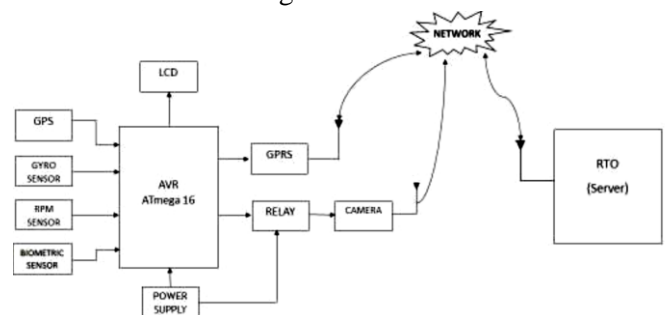The block diagram of hardware design for proposed work is as shown in Fig 1.

Figure. 1: Hardware architecture

The block diagram of software design of proposed work is as shown in Fig. 2, below
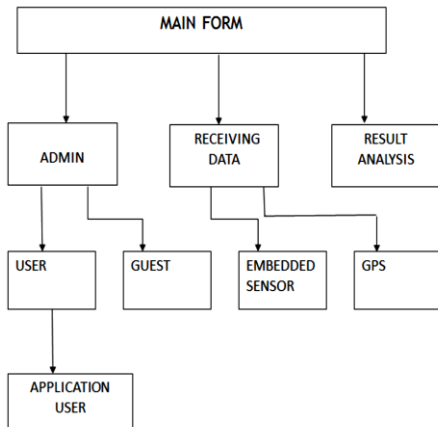

Figure 2. Software architecture

The software architecture is design to manipulate following task & algorithm:

1) Multi Sensor Fusion Method using Dynamic Bayesian Network:

Multi-sensor fusion strategy is a novel road matching method to support real-time navigational features within advanced driving-assistance systems. Managing multi hypotheses is a useful strategy for the road-matching problem. The multisensor fusion and multi-modal estimation are implemented using Dynamic Bayesian Network.

2) Map Matching Algorithm of GPS Data

Many map matching algorithms have been introduced to match GPS points to a digital map previously. But there was short polling time intervals (about 1 second) of the GPS data. The map matching algorithms of such studies are not appropriate for the GPS data with relatively long polling time intervals (about 2~5 m)
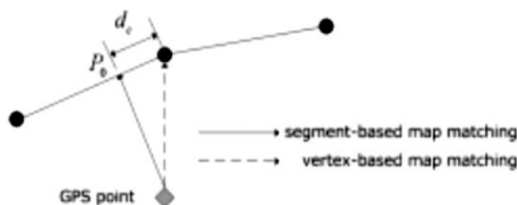

Figure 3: Vertex-based and Segment-based Map Matching

3) Result analysis of receiving data and previous Data

Bayesian Theorem is a means of quantifying uncertainty. Based on probability theory, the theorem leads to a

number representing the degree of probability that the hypothesis is true. To demonstrate an application of Bayesian theorem can be given by

$$p(A|B) = p\{A + B\}/p\{B\}$$

III. RESULTS AND DISCUSSION

In Receiver side Finger Print Sensor is used to detect the entry of the candidate. For the first time the candidate details like name, address, enrolment ID are entered at the server manually. Then the next times the candidate details are generated automatically.

IV. CONCLUSION

The proposed automated driving license test is advantageous over existing manual test. It not only promises the accuracy in driving ability test but also disassociate the test from licensing authority. Hence, it will reduce the manpower and there will be reduction in number of road accidents due to illegal licenses.

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