Vehicular Communication Based Drive Assistance and Immediate Payment System for Tollgate

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***ABSTRACT*-Vehicle-to-vehicle communication is thought to have great potential for improving road safety. It could help save thousands of lives that are lost each year in car accidents. Vehicular communication networks will provide a wide range of applications with different characteristics. In detail, the information exchanged can be of two types, (i) periodic exchange of status messages among the vehicles in the direct communication range and Pass Through tollgate smoothly with v2v communication and toll payment using WFTM (ii) safety messages triggered by a critical event and distributed in a geographical region. Roadside Communication units (RSU) can provide drivers with information which help them in controlling the vehicle. These may be conventional vehicles driven by humans or they could even be autonomous vehicles**

Index Terms: v2v, RSU, ZigBee, Wireless fund transfer method (WFTM)

I. INTRODUCTION

Everyone now a day needs to have a guarantee of safer transport. The vehicle communication system can help to get it. By enabling vehicles to communicate with one another, and their surrounding environment, it is hoped that key information can be shared in order to create a safer and more comfortable drive.

II. DESCRIPTION OF VIHICULE TO VECHICLE COMMUNICATION

A. Automatic fuel measurement and fuel station announcement

The Technology is used to develop a more accurate way to measure the level in the fuel tank in Vehicles. The fuel level should be displayed for the Vehicle so that the Driver will be aware if the fuel level is too low. Now the intelligent system can send the enquiry to know the nearest location of fuel station, then the Wireless Communication equipped fuel station automatically gives the information about that Location.

B. Pass Through tollgate smoothly with v2v communication

Through wireless communication between the in-vehicle device and the toll gate antenna, the cars are able to drive through toll gates without stopping (at speeds below approximately 20 km/h). Tolls are payable in arrears by the wireless fund transfer method (WFTM).

C. Pre safe warning system for with\without driver vehicles

Landslides occur mainly due to heavy rainfall experienced by a Landslide Hazard Zones during the monsoon season and sometimes as an aftermath of an earthquake. The solution this device gives is based upon the concept of low cost wireless sensor networks. WSN method uses a sensor

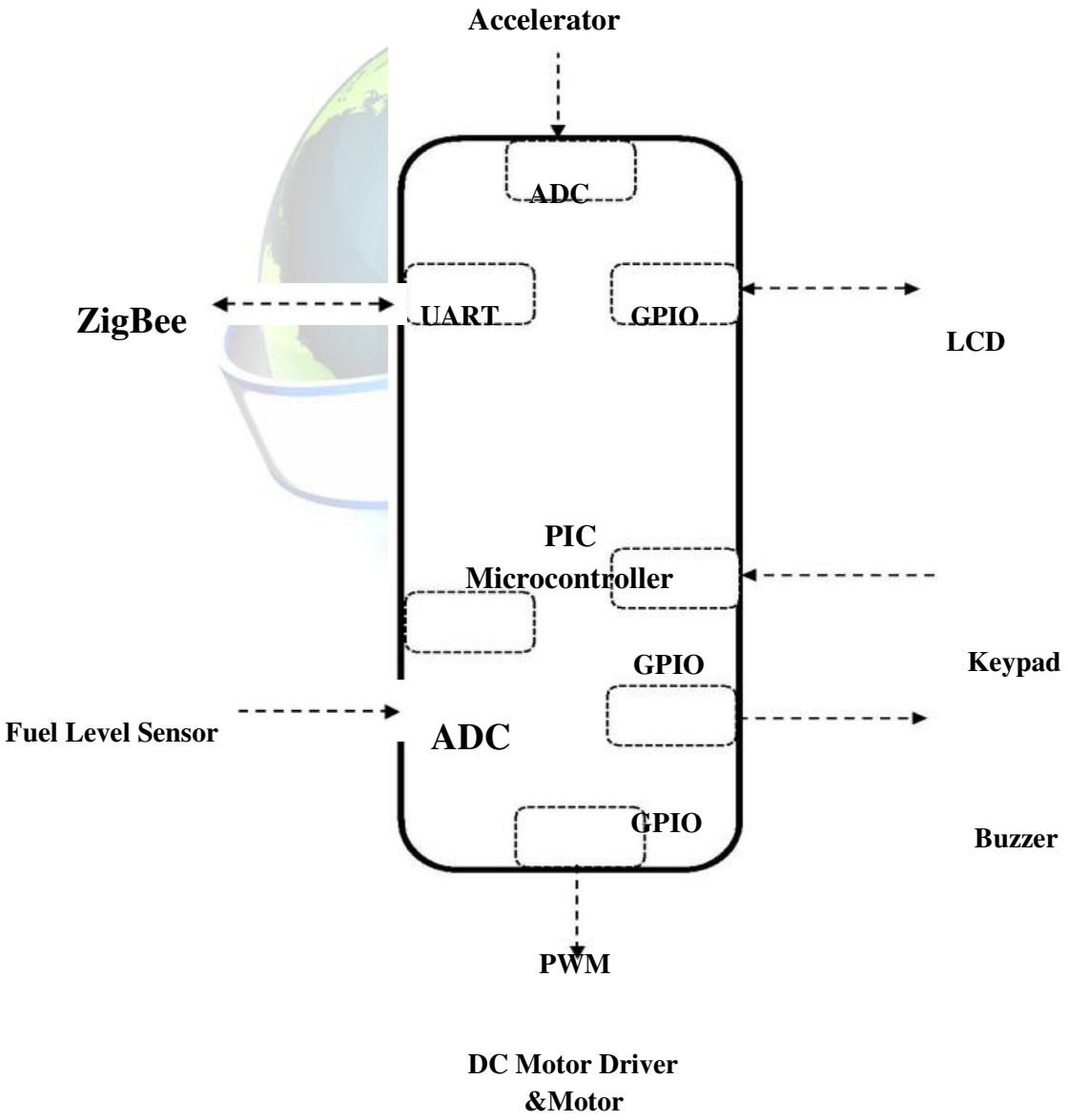
network consisting of sensor columns. The sensor node consists of a MEMS acceleration sensor and a soil moisture sensor, a low power data processing unit (microcontroller) and wireless communication unit. If it detects an approaching landslide or an occurring one, the host intelligent system transmits emergency information. The warning is triggered by vehicles ahead reaching the area.

D. Intelligent vehicle speed control

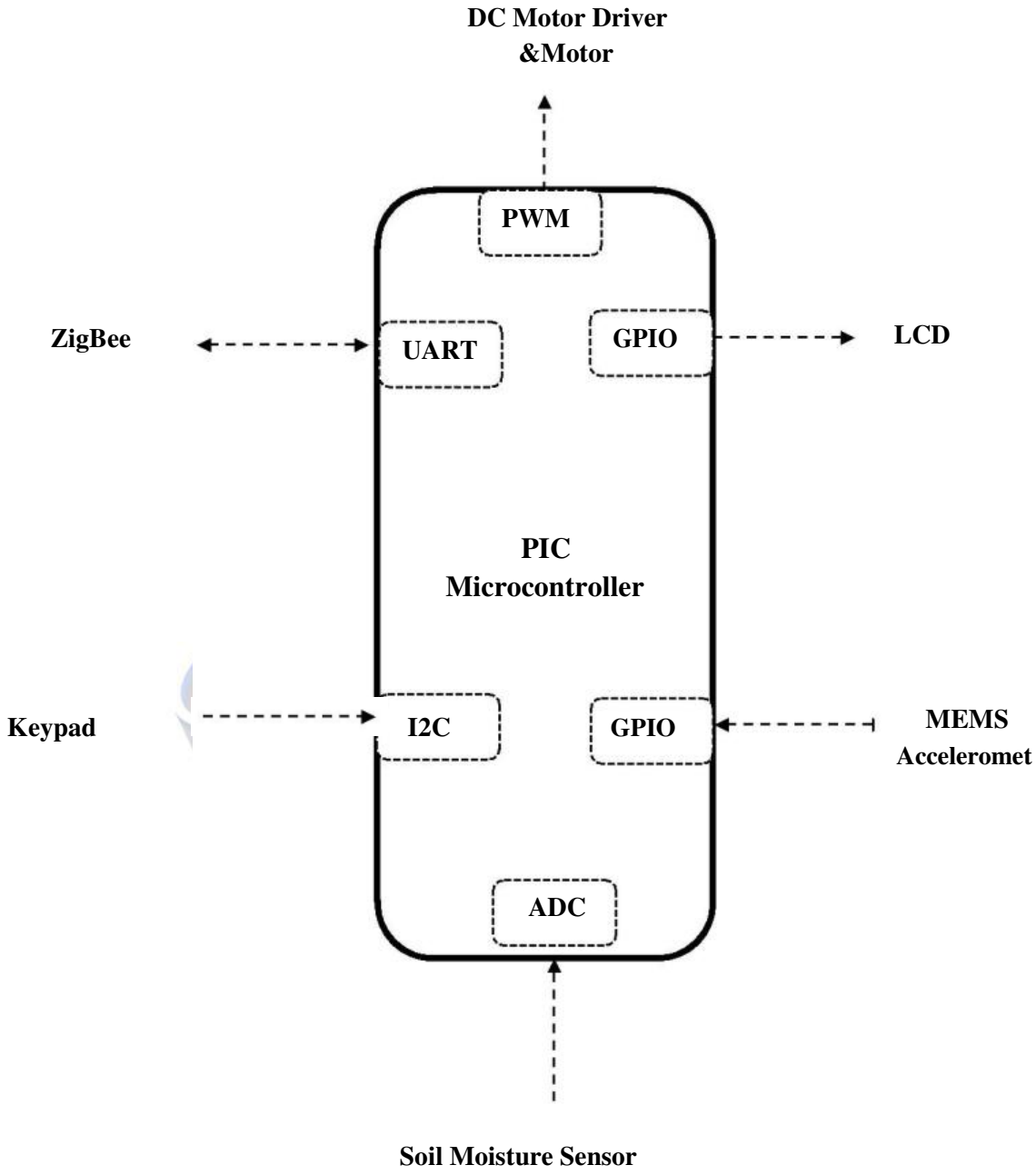
This method for automatically monitoring and/or controlling the actual speed of a non-emergency vehicle relative to the legal speed limit of the geographic area the vehicle is located in.

III. BLOCK DIAGRAM

NODE-1(VEHICLE)



NODE-2 (TOLLGATE)



IV. ZIGBEE COMMUNICATION METHOD

ZigBee is the most popular industry wireless mesh networking standard for connecting sensors, instrumentation and control systems. ZigBee, a specification for communication in a wireless personal area network (WPAN), has been called the "Internet of things". Christo Ananth et al. [2] discussed about a system, the effective incentive scheme is proposed to stimulate the forwarding cooperation of nodes in VANETs. In a coalitional game model, every relevant node cooperates in forwarding messages as required by the routing protocol. This scheme is extended with constrained storage space. A lightweight approach is also proposed to stimulate the cooperation.

Zigbee Data Transfer Model

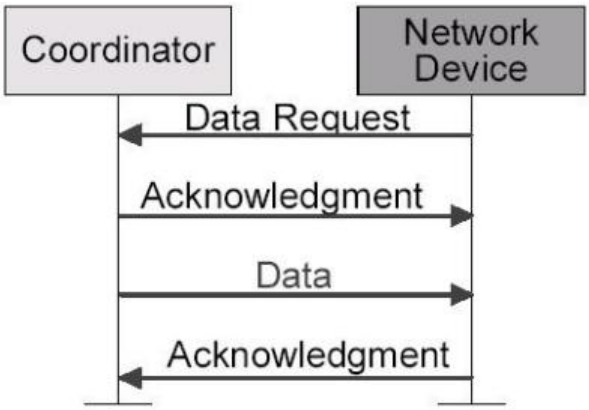
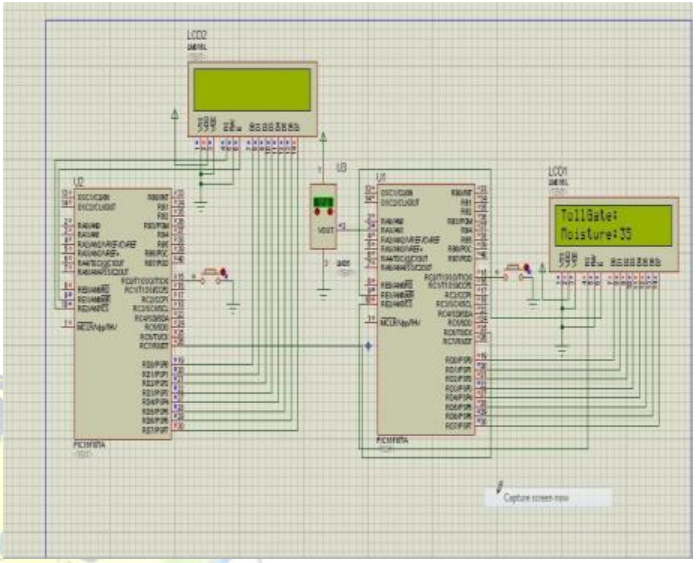


Fig ii) Communication from a coordinator in a non-beacon-enabled network

V. CIRCUIT OF VEHICULAR COMMUNICATION



VI. WIRELESS FUND TRANSFER METHOD (WFTM)

Wireless Fund Transfer Method is mainly for transferring money from one account to another account. In vehicle to vehicle communication WFTM is mainly used to pay toll in toll plazas without stopping a vehicle. In this method the account details are programmed or coded inside the processing unit or microcontroller which is located or fixed inside the vehicle. Whenever the vehicle cross the toll plazas the communication device located in tollgate will detect the vehicle and pass a alert message to the vehicle about the payable amount and it ask for user authentication. After user permission the amount or toll is transferred to the government account from user account. Then the driver or user can pass away the tollgate easily without stopping vehicle

VII. CONCLUSION

It has been shown that, on the contrary to conventional wisdom, manual payment or RFID tag payment system provide little or no improvement in the re healing time or payment method .if the (i) V2V method reduce the traffic time and it improve the safety in road side units.by enabling the immediate payment system in the vehicle will help the driver to continue driving in the tollgate without stopping for toll by using WFTM. This system is more secure than the RFID tag method. (ii) pre safe warning alarm system for with or without driver vehicles generate pre alarm If it detects an approaching landslide or an occurring one, the host intelligent system transmits emergency information. The warning is triggered by vehicles ahead reaching the area and at the time of low fuel detection and it helps in aware the driver about the nearest fuel station. (iii) Intelligent vehicle speed control method for automatically monitoring and/or controlling the actual speed of a non-emergency vehicle relative to the legal speed limit of the geographic area the vehicle is located in.

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