International Journal of Electronics Communication and Computer Engineering
Volume 3, Issue 5, ISSN (Online): 2249–071X, ISSN (Print): 2278–4209

Intelligent Transportation Systems

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***Abstract* – This paper heading "Intelligent Transportation Systems", gives you an idea of how intercommunication between two vehicles or the traffic surrounding could reflect in a less congested and efficient traffic flow. The integration of a simple microchips into vehicles will provide information about that particular vehicle which would be communicated to the traffic. This information would be then used by another computer to prioritize and manage traffic in a far more efficient manner. Example: The information of an ambulance will be different from that of a car. This will be recorded by the computer and the priority levels will be set. Along with the sensors on the road and the vehicle information the computer enables free flow of traffic. This technology is certain to provide safety as well as intelligent management of traffic on the road.**

***Keywords* – Intelligent transportation system, Microchip, Vehicle communication network, Intelligent surroundings, Traffic signal management, Intelligent roads, Inter Communication platform.**

I. INTRODUCTION

Have you ever been trapped at a four way crossing signal when there are no vehicles and you alone are caught in the red signal waiting pointlessly for it to turn green? have you been caught in a traffic congestion when the road is blocked because of an ambulance , riot or politician ? and the list goes on and on, Using simple computer aided intelligence these problems could be sorted out, the urge for a new intelligent transportation system is in great demand. the use of a simple micro chip that communicates with each other and the surroundings is the key to this technology, Imagine your car could communicate with other cars on the road, or communicate with the traffic lights, imagine if ambulances could be detected and the shortest route to the nearest hospital could be routed without any traffic congestion, What if the road or the traffic surrounding could recognize an accident and immediately notify the personal in charge ? There is a wide implementation of this technology that include railways, human traffic in pubic spots, airways etc. The following are a few intelligent transpiration real-time implementations.

II. TRAFFIC CORRESPONDENCE NETWORK

The network that you see in the image (Fig :1.0) is an example of how the vehicles and the traffic surroundings interact and communicate along the way to provide the best possible traffic flow. The sensor on the road detects the presence of the vehicle and reports it to the main computer. The computer computes the number of vehicles on the road and provides the perfect signal timings for each junction. Conceder two roads "X" and "Y" , "X" has 20 cars waiting at the signal but "Y" has only 1 car waiting, the computer finds the least number of car and allows traffic flow for the road "Y". This algorithm can vary from signal to signal depending on the need. During exceptional conditions where and ambulance is rushing its way to the hospital the sensors on the road detect a integrated microchip in the ambulance and automatically reports it to the main computer. Here the computer will attempt to shut down all the other lanes and provide a route for the ambulance to reach the hospital without causing any confusion on the road. Microchips can be integrated into other important vehicles like politicians or V.I.Ps so that the traffic congestion does not occur.

When a vehicle is a distance "X" (where X is a variable denoting the distance in the vehicle, it is usually set but the user) the sensors pick up a signal and sends it to the main computer the main computer then checks with the traffic block in the other lanes , then it compares it so that the driver spends least amount of time at the signal and there is no waiting time. This intelligent modes can also be over raided by a manual mode which allows the user to take control over the full system in case of any emergency, during the over ride the system will follow a normal counter sequence to allow the traffic flow in the lanes.

The system can also be set in such a way that, It over rides the normal timer in case of traffic jams, Seniors transmit information to the main computer running a diagnostic every thirty seconds enabling the computer to be aware of the condition and traffic status, When a traffic jam occurs the computer immediately over rides the default system and creates its own timer sequence aiming to clear the traffic jam as soon as possible. This over ride is said to improve the traffic flow and is termed " Exception Auto Raid " this exception auto raid can occur at any time depending on the status on the road, when special vehicles like ambulances or army vehicles are detected the computer gets into the Exception Auto raid mode providing a prioritized traffic flow.

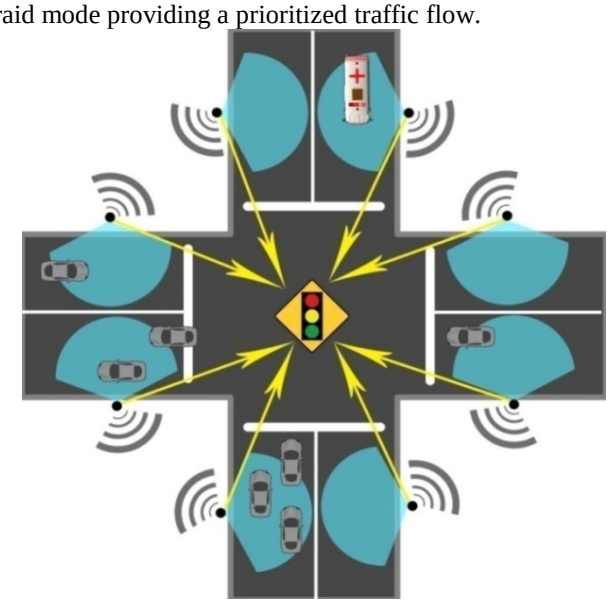

Fig.1.0. Example of an intelligent surrounding.

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III. Interconnection with Outer Networks

In case of a road accident like you see in (Fig 2.0) the system will automatically shift to the exception auto raid mode where the computer locates the accident using the sensors, This data is the sent to the Police or the personal in charge of road accidents so that the become alerted. The rest of the road traffic is managed by the computer. Details about the location and time are calculated using the GPS so that the police and other personals can come to the site of accident. Cameras placed along the roads could be linked with this system so that the site of accident can be located easily. The integration of various technologies with this will help improve the road safety and traffic flow.

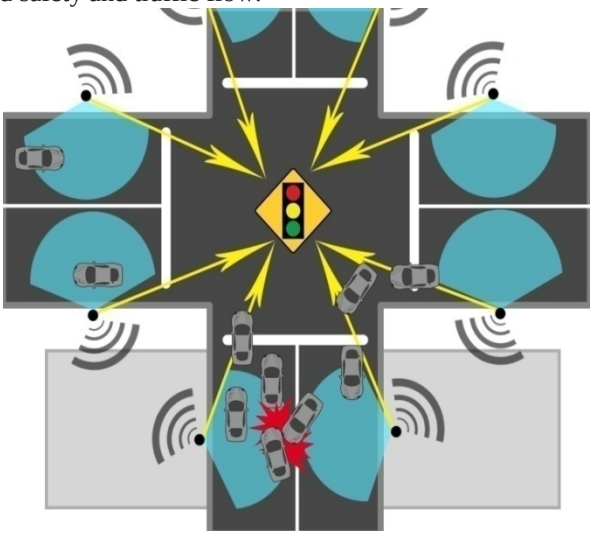

Fig.2.0. Example of an on road accident

Fig: 2.0 shows the traffic flow in a particular junction where there is a sudden accident this triggers the sensors and the computer recognizes it as a exception and takes over the system. This is then notified to the personal in charge so that further actions can be made. The location of the accident is pointed using the GPS and the site of accident is found so that other actions can be made

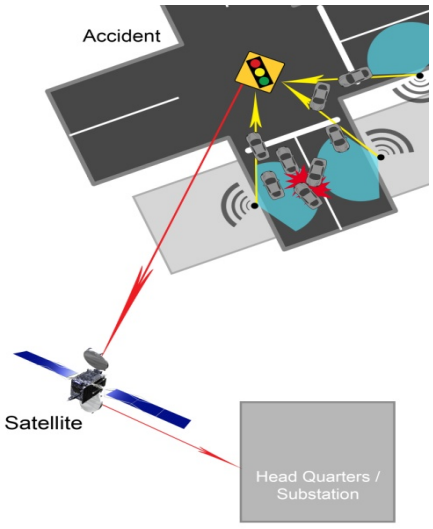

Fig.3.0. illustrations on how other networks are used.

Fig: 3.0 shows how the system interacts with an external and more universal system like the GPS, it allows the user to locate the accident and get to that place using GPS integration. The figure clearly illustrates the transfer of data from the local network between sensors and the main computer with the more expanded and universally used GPS.

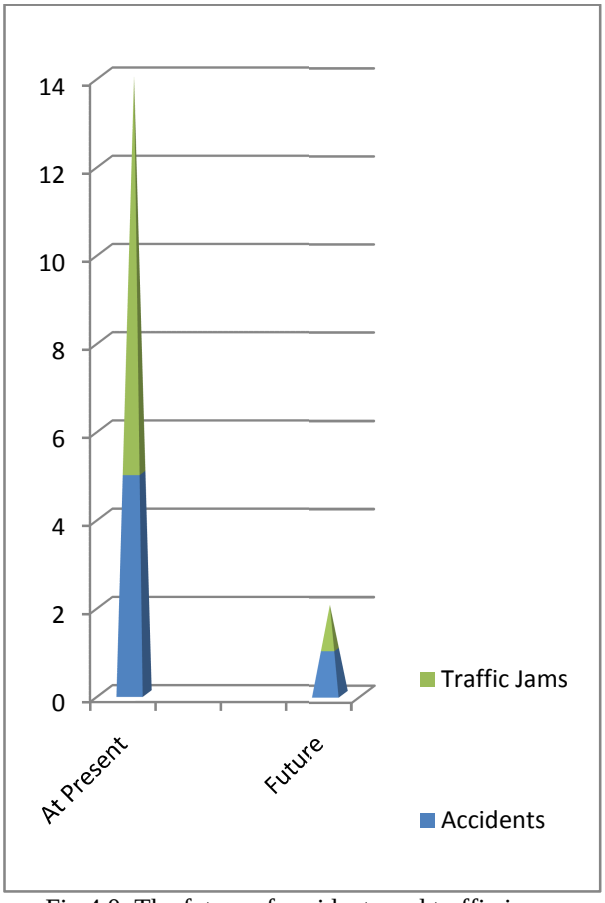

Fig.4.0. The future of accidents and traffic jams.

Fig: 4.0 Shows the drastic change in the traffic a rend accident rate after implementing this technology in the coming years. The rate of accidents and traffic jams are reduced dramatically so that there is always free flow of traffic.

IV. Conclusion

In Conclusion this amazing technology the endless possibilities of the use of microchips for computation and communication is being discovered. The open options for developing better systems based on this are in the near future.

What vehicles could communicate within them? While driving you could locate your friends near you using an integrated micro chip in the car, forming a social network on the road. Where you can automatically communicate with friends inside their cars when they are near you ? What if these chips had integrated functions to locate diversion and bad roads before you even made the turn?

This will explore the world of application development and app developers would contribute amazing applications

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which would combine both hardware and software to form a network of on road relations and safety enhancements

The possibilities of the road sensors to collect feedback about the vehicles condition and collecting this in a database would help both users and technicians to enhance the vehicles performance, maintenance and sustenance.

The endless possibilities of this technology is expected to be a marvel in the digital future of mankind where everything is controlled my intelligent “mini programs” and “smart dust” in the near future.

ACKNOWLEDGMENT

The author would like to acknowledge the works of “Intel” in same field which helped him to understand more about microchips and atom processors used in this field.

“DARPA” for their use of sensors in robotics and image processing technologies, and their “Urban Challenges” which played a major role in compilation of this paper.

Prof. D.C Joy Winnie Wise , HOD (Department of Computer Science and Engineering) ,Alpha college of Engineering, Chennai for the support and motivation. And

Mr. Dhinesh Joseph, Faculty member (Department of Information Technology), Alpha College of Engineering, Chennai for guiding and mentoring.

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The author (Johnson Kevin Rodgers) was born in Salem, India. The author is currently doing his undergraduate course in field of Computer Science and Engineering (i.e. B.E CSE) at the Alpha College of Engineering, Chennai, Tamil Nadu, India. Currently the author is doing a research on computer based intelligent society management.

Intelligent Transportation Systems, Mr.Rodgers is on of his personal researches that will soo be implemented as a test project in India in cooperation with the Traffic Control Office. Mr. Rodgers has done various works on smart computing and application development that would bring solutions to problems faced in both rural and city communities.

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