

AUTONOMOUS CAR

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Abstract: Autonomous cars are going to lead our cars of present scenario to become the future cars. From their early developments to the current outcomes, they have been modified several times and soon will be expected to reach the satisfaction to be considered as the one of the most perfect cars on road in the near future. The concept to create a successful autonomous consists of its efficiency to be driver less further implementing to be safe on roads. Autonomous cars are basically to be called as the future driven cars without any human input, capable of sensing their environment termed as the solely robotic cars .The future of the robotic cars is said to be growing faster from their early developments to a perfect destination. However, the attempts to create an autonomous car have been continuously stridden forward; evolving through eras in its technological advancement .The prospectus of these cars is to be clearly advance and to minimize the problems being currently faced. The necessities to make them absolutely safe in terms of traffic surveillance and predictions, necessary attempts have been carried to make them much able to sense the environment as to avoid crashes. The idea of future cars is a bit absurd and its outcomes are sometimes threatening but they will be soon going to take the roads in the coming future and not being count into vulnerability because of its extremities.

Keywords: Global positioning system (GPS), Global System for Mobile Communication (GSM), Microcontroller, sensors, motor drivers.

I. INTRODUCTION

The autonomous car is a great deal to handle and drive with. Manipulated with unique approach of driverless system, it has attracted a lot of tech lovers to study and enjoy their modular structure.The early developments to this dates back to 1980s when the first attempts to this was associated with Carneige Mellon University. The first major milestone was put forward by the CMU'S Navlab 5 in 1995 and a long distance drive was accomplished with the autonomous car. The journey was through Pittsburg to San Diego speeding with 63.8 miles per hour. From then the development of prototypes is on the way. These self-driving cars uses distinguish techniques to control themselves, usage of sensors, radars, GPS, lasers, odometer and computer vision. Through this approach they can navigate through their paths can detect hindrances and obstacles and can find measures for these queries to be solved. Much of the work is done by the microcontrollers which will be responsible for taking decisions using sophisticated algorithms, it is a model of complex integrated networks between different components used in it, running processors to analyze decisions and a complete circuitry, on which their better working makes these cars reliable. These cars are put to test by millions of times in public roads to refine it's working and operations and had ended up with appreciable positive results.The expected outcomes of these cars are said to avail in reduction in the costs, increased performance, better satisfaction among all kinds of people, easy to handle and maintaining traffic flow, lower fuel consumption. Despite its immense advantages there are hindrances to replace it with conventional vehicles. Individuals are risked with their potentials of security and privacy as for the first time a robot is going to drive it. Problems such as liability to them and trust concerning with them.

II. PROPOSED METHODOLOGY

The Methodology used in the autonomous cars is about the working of microcontroller, using GSM, GPS and sensors to drive it. The inputs are given by the user using cellular phones to guide the system which includes destinations, arrivals etc.

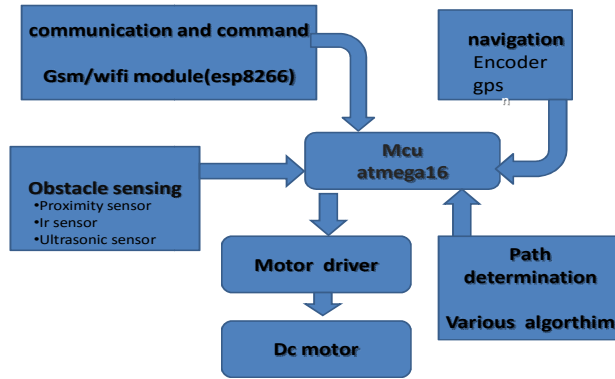


Fig.1 BLOCK DIAGRAM

The GSM is fitted into the system which took the responsibility to signal the microcontroller, used as to exchange the data a kind of connection between the microcontroller and itself. When the instructions are passed to the microcontroller, it takes the decisions and signals the GPS to track the inputs given by the user which in the case are destination and arrivals. The GPS is held for the navigation purpose, it compares the present position with complex analysis to find location.

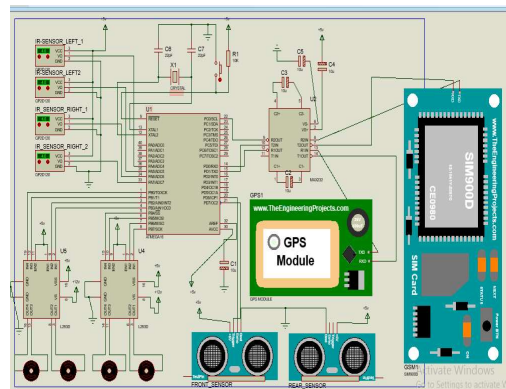


Fig.2 circuit diagram

This is the circuit diagram of autonomous car. The main component of this circuit is ATMEGA16 microcontroller which is basically called the brain of this project. This IC consists of 40 pins and has four ports namely port A port B port C and port D. Each port is of 8bit.It provides an interfacing medium between different devices used in this project.

Here we have used 4 sensors that is two ultrasonic sensors and two IR sensors. Ultrasonic sensors are used in forward and backward direction to detect the obstacle. IR sensors are used in the right and left directions. The sensor will emit an infrared signal to a certain direction and then waiting for the signal to bounce back when there is an obstacle or wall. There are two motor drivers used in this project. One motor driver is used to drive the two wheels and motors are connected to the wheel made of rubber.

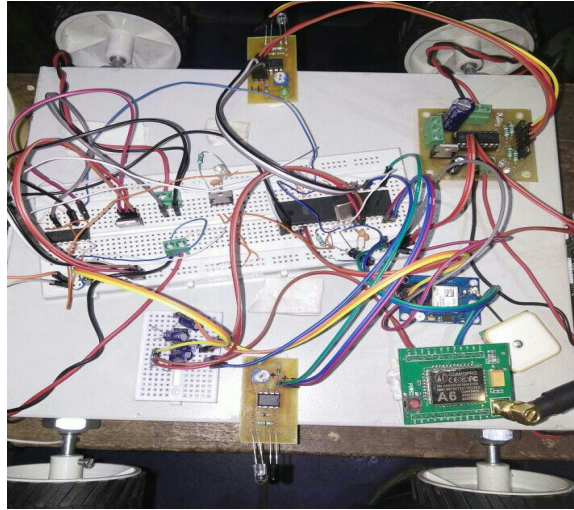


Fig.3 Assembled hardware of autonomous car

The above circuit shows the assembled model of autonomous car in which all the devices used in the project like microcontroller, GPS(GLOBAL POSITIONING SYSTEM), GSM(GLOBAL SYSTEM FOR MOBILE COMMUNICATION), MAX232, motor drivers, sensors ,wheels etc are connected in desired manner.

III. SOFTWARE DESIGN

In this project we used C language to program the microcontroller through which GPS and GSM are connected via MAX232. In GPS we attached a SIM whose mobile number is programmed in to the microcontroller and using this we give the location and microcontroller instruct the GPS to track the location.

IV. CONCLUSION

The Future aspects of the AVs are one the most crucial and essential steps for the growth of automobile industry. They have proven to be the truest example of advancement in the infrastructure of automobiles. They not only provide us driverless systems but too avoid crashes, pollution, consumption of fuel and various other benefits including reduction in energy and congestion. The paradigm of AVs is supported to replace the existing vehicle markets, the process will take a few years to come into existence. The current developments are raging to bring the AVs into rapid success and the tremendous upgraded versions of these will be a success in the transportation system. They will be taking commercial business in coming decades with the reduction in their expenses.

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Autonomous car implemented using ATMEGA16 microcontroller based on AVR enhanced RISC architecture.