

# Novel Approach to Lane and Path Detection in Unmanned Ground Vehicles

Rajeev Jha<sup>1</sup> Ankush Dubey<sup>2</sup> Hammad Khan<sup>3</sup> Soham Mozar<sup>4</sup>

<sup>1,2,3,4</sup>Department of Computer Engineering

<sup>1,2,3,4</sup>Thakur Polytechnic Kandhivali East Mumbai 400101

**Abstract**— In these growing technology, a lot of research has been going on in the road of vehicles, which also take all the ground vehicles, water vehicles and the vehicles that are on air. It is usually used in military. Now a days, many universities and research institute are researching in new UGV technology for commercial use such as transportation service. Among this here we are concerned about the path detection. This monitoring and detection system includes lots of sensors. So the main intention over here is to acquire the same result with the use of less number of sensors and hardware. The way needed for the reduction of the road accidents has enhanced it to implement at a very high level. Autonomous vehicles has a very nice market due to their cost. To reduce the costs and facilitate the use of own vehicles to the local person, we have use less of sensors are very less and the cost is maintained as per the need. This is going to be enhanced the computer version in private vehicles. In this the new concept of lane detection with sensors. We have introduced the new concept of path detection. We have introduced these concepts for the purpose of real time operation. Experimental results, obtained by applying the proposed concepts or methods on varying conditions of illumination, and making the use of real time video feed. A significant detection under varying conditions with a relatively simple hardware is observed.

**Key words:** Transportation Service, Vehicles, Path Detection

## I. INTRODUCTION

As human drivers the road sensing in developed areas are autonomous. Unmanned vehicles mostly used sensor for the detection of lane and path. In developed, urban environments, it consists of the feature of the lane detection and path detection and or distinct appearance characteristics of road surfaces.

However for the roads of village or rural environment no assumption is made that how the roads are. There is marking on the grounds on the road or no proper distribution of the road. Further, many strains are there on the road (soil, grass, rock, etc.) with complex characteristics and the bad weather and shadow, which make distinguishing road regions from surroundings extremely difficult.

To look the shortcomings, many things are on the way in the research center for the management of the road directions rather than locally measurable features. Here the project includes we have discussed about the path detection and lane checking using less number of sensors possible.

The use of path is always done with the lane detection using some sensors.

This system can guide the autonomous vehicle in a better way with low cost than the existing technologies. The autonomous vehicles are the era of interest of many

scientists today so this kind of system or technology can provide a fast track towards the research in that field.

## II. WORKING PRINCIPLE

The system proposed over here uses few sensors and hardware for lane and path detection for personal vehicle. The sensors used over here are color sensor and IR sensor. And the camera module is used over here for the real-time video feed. The microcontroller used over here is AT89S52.

The Color sensor is used to detect the color of lane on road. As the color of the line separating road lanes on road is white and usually the color of the road is black, color sensor can easily detect that color. In this way the autonomous vehicle will be made to follow the lane with the help of information about color provided by the color sensor. The color sensor will continuously detect the color on the road and if the vehicle crosses the line is used for separating the road i.e. if vehicle moves towards the different lane then the white color of that line will be identified and the autonomous vehicle will be controlled accordingly. And lastly IR sensor are used for the detection of obstacle and if any obstacle found then automatically the vehicle will be stopped. This is an advantage of this system as it provides the security to the vehicle.

Also the video is attached with the vehicle which gives the real-time view on the road. So any markings on the way will be identified and vehicle will be controlled accordingly from the remote place. The main authority can control the autonomous vehicles from remote place according to the information taken by sensors and send to him/her via Zigbee. The wireless medium used here for transmission and reception is Zigbee. It is low in cost with the comparison of other technologies.

## III. MICROCONTROLLER AT89S52

### A. Pin Configurations Of AT89S52

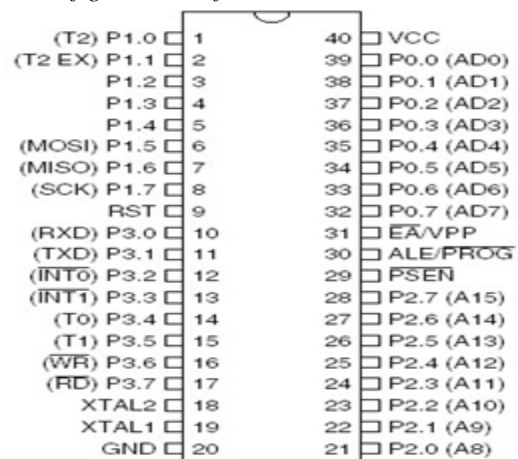


Figure taken from a datasheet provided by ATMEL™

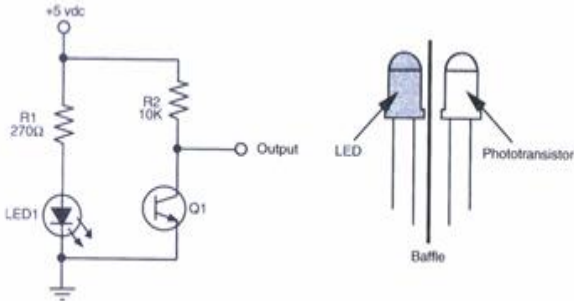
Fig. 1: Pin Diagram Of At89s52

Pin Description:

- a) VCC  
Supply voltage.
- b) GND:  
Ground.
- c) Port 0:

It is an bidirectional 8 pin port

- a) IR SENSOR



The basic design of the infrared proximity sensor.

Fig. 2: The Basic Design Of The Infrared Proximity Sensor

- b) The photo contains an infrared sensors which contains for the detection an object's farness robot. The difficulty is that the sensors are to be attached on the wings. The sensors are attach on the tips of the wing will help the robot navigate.
- c) The absorvation can occur in the region of the depletion, or one diffusion length away from it, these carriers are from the one region of the photodiodes. Photodiodes are used as zero bias and reverse bias . Very less part of the electricity induce by the reverse. The thing is that is used in reverse bias. In this expanding the real case and giving strength and infrared sensor for the pair to handle in the desired manner. In these technology we are using a distance of 5mm.
- d) Read the indicated color code value then select the OHM-scale. A resistance is better if the resistor will be good is near to the inducted. Tolerance reading is done in ohmmeter.. When the resistor are not present reading on the ohmmeter scale. The zero reading is all ohmmeter scale settings, resistor is shorted.

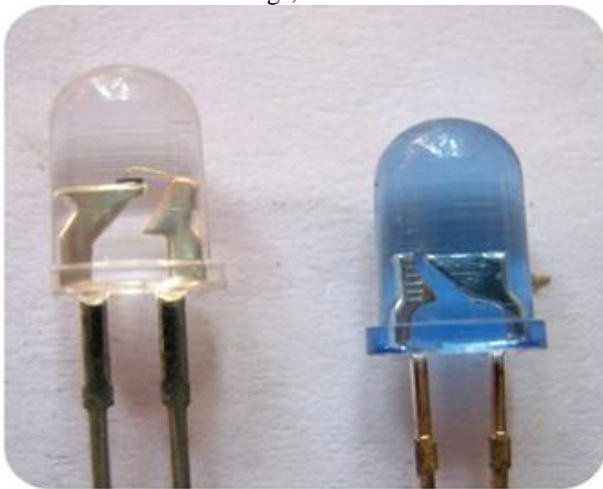


Fig. 4: Sensors

- e) Positioning of Sensors

The resistance of the sensor is decreased when the infra light falls on the sensor. A good sensor is with then zero resistance in presence of light. There are many types of

sensor ultra sonic, light emission etc, the outputs of the sensor modules are fed to the Non-inverting input of a comparator . The reference comparator is with the feeding input of the comparator by a trim tuning devices are connected on the line. LM339 is the integrated circuit with advanced technology the analog signal. The output in LM339 is the compatible TTL are directly connected the the rays.

#### IV. HOW TO TEST CAPACITORS

The misuse in the dielectric material most the capacitor are not working. The terminals which are defected can have a shorted internal faults, excessive use and misuse of the capacitance meter. The terminal gets discharged when the terminal is shorted.

A good symbol of the capacitor moving towards the zero. For ceramic, and other capacitor the meter will not detect the 1Uf. A false indication of the electrolytic capacitor the meter will rest at zero, which is an indication that the capacitor is boycott.

#### V. CONCEPT OF COMPILER

Compilers are the language use to convert from program. The output for the object compiler code code is produce in the compiler but not for the other microprocessor. The Dos compiler is different form the other compilers because they use a different station. So if someone need to tell the complier so it can be said as the converting the code of source from the byte code.

The use of the interpreter is that check the program immediately. The sources code becomes into object code by the compiler.

#### VI. KEIL C CROSS COMPILER

The company is a German company. The different development tools like the integrated development tools are provided by these company.

#### VII. EMBEDDED C

Use of embedded processors in passenger cars, mobile phones , pharmaceutical equipments, aerial equipments and other devices like washing machine, television, are available.

#### VIII. CONCLUSION

The goal of this project is about the path detection and lane detection with the help of less no of sensors. This system can enhanced with low cost and flexibility.

#### REFERENCES

- [1] IEE paper . 1. Novel approach to lane and path detection from Ananya Venkatalaxmi B Engineering College.
- [2] <http://www.vogella.com>
- [3] Lane and Path tutorial from [www.youtube.com](http://www.youtube.com)
- [4] Lane and Path detection queries from Stack Overflow.