Artificial Intelligence used in Autonomous Car & Research

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ABSTRACT

Artificial Intelligence (AI) has drastically revolutionized the automotive industry by introducing the Autonomous car. Autonomous car that use AI allow passengers to relax and enjoy their ride without having to drive themselves. This the paper presents an abstract of an AI-based Autonomous car system that incorporates machine vision, natural language processing, and deep learning algorithms to allow the car to navigate on roads and reach its destination without human intervention. The system can detect and recognize traffic lights, road signs, and other vehicals on the roads. the system also utilizes natural language processing algorithems that can comprehend passenger commands and respond to them accordingly.

Keyword : - Autonmous car, research, real time navigation, Lane detection, Signal detection, Stop sign detection.

1. INTRODUCTION

Autonomous vehicals, also known as self –driving cars, are rapidly becoming a reality on our roads the use of advanced technologies such as machine learning ,computer vision and artificial intelligence has made it possible to develop vehicals that can navigates roads, avoide obstacles and make decisions on their own. The development of autonomous cars has been the subject of intense research in recent years. There has been a significant increase in the number of research papers published in this field covering various aspects of autonomous vehicals such as their safety , reliability, and performance

This paper presents an overview of the current state of autonomous car research we examine the various approaches taken to develop autonomous cars , including the use of sensors, machine

learning algorithms, and contol system we also discuss the challenge associated with developing autonomous vehicals and the potential benefits they offers. Finally, we provide an insite into the future of autonomous car research and the impact that this technology is likely to have on our society. We hope that this paper will provide a comprehensive understanding of the current state of autonomous car research and inspire future innovation on this exciting field.

2. LITERATURE SURVEY

In literature in this paper they have presented an autonomous car platform based on the soft max function squashes the output of each unit to be between 0 and 1, similar to a sigmoid function, the soft max function act as a sigmoids function by ranging the output while all actual softmax function does not do that using a neural network helps in giving real time output .they have implemented the model on the MATLAB simulator before actually implementing it. The system uses only one single camera for all inputs and it drives at about 5-6 km/hr whether the lan markings are present or not. this model only detects lane markings and turn signs it just hovers the car left or right and does not sense signals or stop sing.
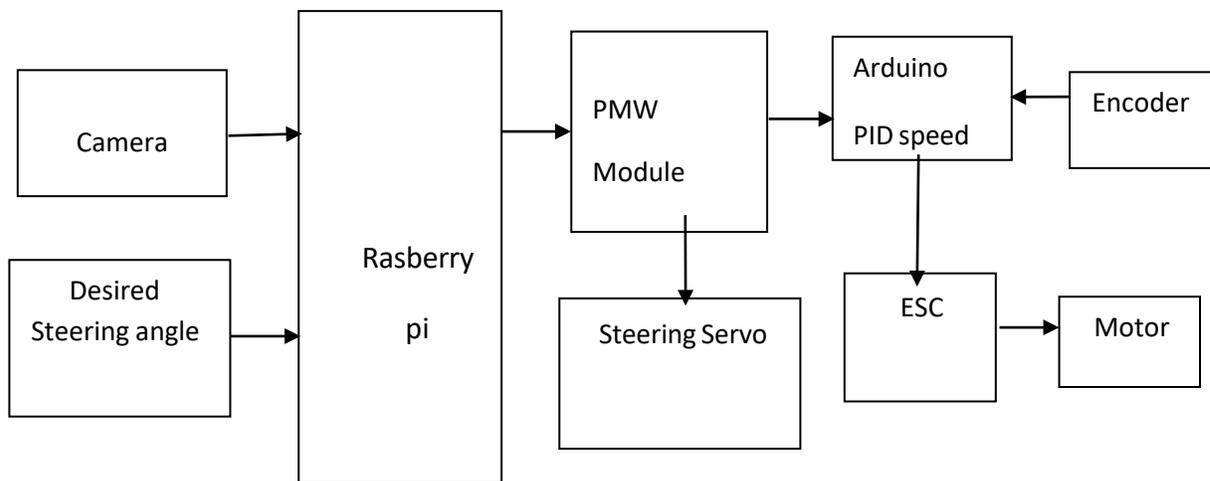
3. PROPOSED SYSTEM

This paper plans to planning to provide a Autonomous car with a system that can navigate between two places on the map detect any obstacles, lane detection, accident avoidance and emergency services. and our projects uniqueness is we are implementing traffic signal responding with is not present in Tesla and other companies car.

A autonomous car is a vehicle that uses a combination of sensors, cameras, radar and artificial intelligence (AI) to travel between destinations without a human operator. To qualify as fully autonomous, a vehicle must be able to navigate without human intervention to a predetermined destination over roads that have not been adapted for its use an artificial intelligence-based autonomous car system require a combination of hardware and software components to function effectively.

The car should have a range of sensors, including cameras, radar, lidar, and ultrasonic sensors, to detect the surrounding environment and objects. The car should have a powerful processing unit capable of handling large amount of data in real-time.

The car should have safety features such as emergency braking, collision avoidance. The car should have an easy to use interface for passengers to interact with the system, such as touch screen or voice recognition system.

Raspberry pi is the main component used in the project .It is credit card-sized single-board computer which is trained to recognize images, compare and finally implement the algorithm to take immediate action most suitable for the input image.

Overall, an AI-based autonomous car system should be designated to provide a safe and comfortable ride for passengers while minimizing the risk of accident and collisions.

Autonomous car will be capable of fulfilling the main transportation capabilities of a traditional car without human input. It will allow for more productive use of time spent in a vehicle and reduce crashes. Also it will help in reducing accidents, traffic jams, and the costs of congestion, energy consumption, and pollution.
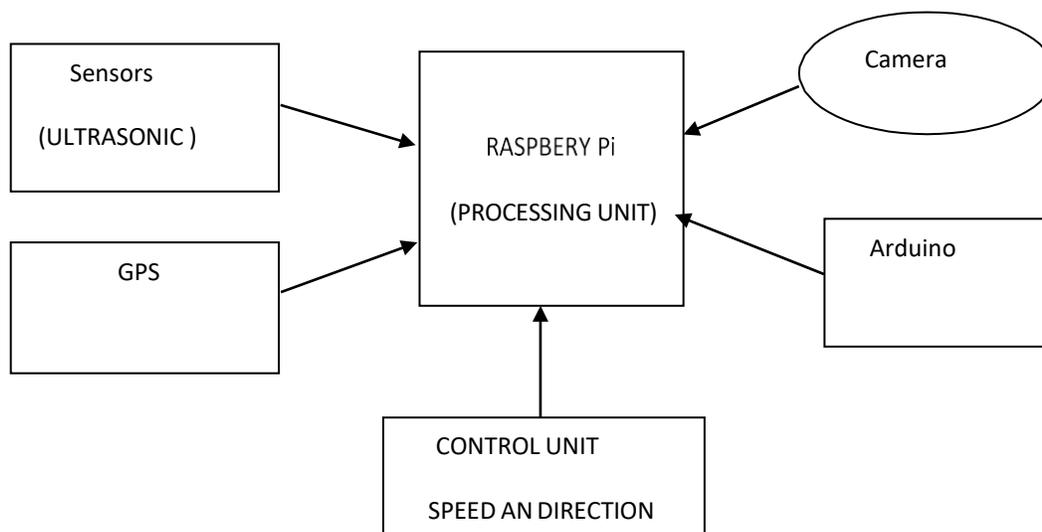
Figure :- basic block diagram of project

Components used in this project :-

Raspberry Pi :-

The below shown image b Raspberry Pi it enables people of all ages to explore computing, and to learn how to program In languages like Scratch and Python.

fig – Raspberry Pi

Ultrasonic Sensor :-

The figure given below is ultrasonic sensors. It measure distance by using ultrasonic waves. The sensor heademitsem ultrasonic wave and receives the wave reflected back from the target.
There are two other sensors that are one is LDR sensor and another sensor is vibration sensor

fig.-Ultrasoic sensor

Camera :-

- Cameras work on the basic principle of landing the light emitted from the objects on a photosensitive surface through a lens.

- Logitech c270

- for lane and vehicle detection.

fig:-Logitech c270

GPS :-

A GPS navigation system is a GPS receiver designated for a specific purpose such as a car-based or hand-held device or smart phone app. The global positioning system (GPS) is a 24- Satellite navigation system that uses multiple Satellite signals to find a receiver's position on earth.

4. RESULT

Artificial intelligence based autonomous cars are vehicles that use AI algorithms to control various aspects of their operation, obstacle avoidance, and decision making .These cars are designed to operate without human intervention, allowing passengers to sit back and relax while the car drives them to their destination.

5. CONCLUSION

Autonomous in cars in real world is a very big field. where many sensors come in to action, our idea is to solve many of those into two sensors by detecting distance and objects like stop sign, signals and other obstacles. This technology has been on the rise in the recent past and promises to have a better future transport sector. The technology in driverless car has impacted road safety, parking problems, and environmental pollutions. The major demerit of this technology is the loss of jobs and skills among many drivers. However, the technology is yet to be fully implemented to achive fully autonomous cars hence future research

6. REFERENCES

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