Review on Multifuntional Autonomous Car Using IOT

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Abstract-Smart cars that are predicted to be driverless, most effective, and accident avoidance will be autonomous vehicles. To achieve this goal, some work has to be done in this area to realize the problems and overcome the obstacles that are currently faced in this area. According to this, the first task would be to understand the major problem behind this and to adapt new technology and skills into normal vehicles in order to transform them into the future autonomous vehicle. This paper tells about the transformation of normal automobiles into autonomous vehicles through the adoption and application of several emerging technologies. Included in this are the goals of autonomous cars and the challenges associated with their execution. Various kinds of sensors are used such as like ultrasonic and infrared sensors in order to avoid obstacle detection, line following and hand gestures which would reduces accidents caused by human beings. Arduino Uno is a microcontroller used here that receives signals from a particular used sensor. This would bring a low cost-effective and also avoid accidents.

Keywords: Deep learning, sensors technology, CNN, image processing, sound information technology open CV , Yolo V3.

1. INTRODUCTION:

A self-driving or autonomous car is one that can sense its surroundings and move around on its own without assistance from a driver. To function securely and effectively, these automobiles rely on a variety of technologies, including artificial intelligence (AI), machine learning (ML), computer vision, and the Internet of Things (IoT). Moreover, IoT can assist autonomous vehicles in gathering real-time data on traffic, weather, and road conditions and utilise that data to plan routes and increase driving efficiency. IoT technology can allow autonomous vehicles to share information about their location, speed, and road conditions with other vehicles on the road. Through improving communication, accidents can be avoided and traffic jams can be lessened is important for the creation and use of autonomous vehicles. Driving is made safer and more effective thanks to IoT technology, which allows autonomous automobiles to communicate with other vehicles, infrastructure, and equipment. In order to decide on speed, direction, and other driving manoeuvres, an autonomous vehicle, for instance, can employ IoT sensors to identify traffic, pedestrians, and other cars on the road. An automobile that can perceive its surroundings, choose the best path to its goal, and drive itself is referred to as a completely autonomous vehicle. In other words, autonomous vehicles are refers to a smart cars or robust cars where many operations can takes place. This technology will benefit cars in its own right. It's likely to significantly lower pollution, energy use, and collisions. Major OEMs recently stated their intentions to start offering these cars in a few years. The regular man's daily inconveniences on the roadways are getting worse every day. Meeting accidents and being late for work, school, and hospitals are two important concerns that happen frequently [1]. In 1977, the concept of the autonomous vehicle was introduced in an effort to solve these problems. In recent years, numerous scholars have conducted in-depth research on this concept. The suggested system may maintain a safe distance between vehicles, follow the road, stay in the appropriate lane, execute overtaking, and avoid obstacles. the topic of dynamic obstacle avoidance, planning and control of a double-steered vehicle's actions, and autonomous maneuvering. The use of GPS-based driverless automobiles in low-cost implementations has been discussed. focuses on giving the gas-powered Calvino automatic driving capabilities with an onboard sensor system and an autonomous guidance system. It has been stated how linked vehicle technology has advanced from smart vehicles to self-driving cars and also explains how the legal responsibility for collisions with other vehicles, pedestrians, or property will be determined. It has been proposed how to detect autonomous vehicles

effectively and explains the benefits and effects of autonomous vehicles on our daily life. In recent years, a lot of work has been done in this field. a few of the most recent developments in this field. This study presents unique and very straightforward circuit designs for an autonomous vehicle.[2] In the present world there exist any robots that are developed based on robotic arm, line following robot, obstacles avoiding robot and so on. These robots are built on a specific function to perform. For instance, a robot arm can pick an object and what if the object is far from the hand. These kinds of operations do not serve human needs these needs to be implemented in AI [3]. For this reason, most of the military robots are manually controlled since manual control can be more or less and the way of communication with these robots are very important. In the present world the value for the dedicated robot has been going less thus a robot should perform multiple task or function to survive.

2. SURVEY PAPERS

Sl No.	Paper Title	Year of Publication	Technique Used	Result	Remarks
01	Development of autonomous car[1]	2022	Image processing and microcontroller	Examination on the recent advances on autonomous driving provides 60%of accuracy on image processing	Review of autonomous vehicles technology covering issues of design implementation.
02	Autonomous cars [2]	2022	Machine learning	Autonomous vehicles are implemented from the basic robust cars which provides efficient fuel using machine learning	This research paper reviewed general advancements and improvements of developing autonomous cars based on machine learning
03	Smart phone controlled multipurpose robot car[3]	2022	Convolutional Neural Network algorithm	This technique developed fairness-based algorithm FDs, MIMF on multifunctional autonomous car to improve their accuracy rates	This paper proposed the algorithm which supports convolutional neural network
04	Design of an IoT based autonomous vehicle[4]	2022	Image processing and microcontroller	Examination on the recent advances on autonomous driving provides 80% of accuracy based on image processing	Review of autonomous vehicles technology covers the issues of design implementation regarding microcontroller and image processing
05	Autonomous vehicles based on robust control [5]	2022	Artificial Intelligence	A generic framework for deep learning policy transfer using RC technique has been achieved to drive autonomous vehicle	In this review paper, they make use of sensors, cameras, radar to build autonomous vehicles based on artificial intelligence
06	Autonomous vehicle implementation predictions[6]	2021	Artificial intelligence	This paper provides 75% of accuracy rate in image processing	It has been reduced many accidents by achieving obstacle detection

07	Core selection auctions for autonomous vehicles public transportations[7]	2021	Artificial Intelligence	In addition to investigate suitable, optioning mechanism for such multi require process to improve autonomous vehicles in working with sensors	This paper says that it has been achieved a good accuracy rate in developing autonomous vehicles using artificial intelligence
08	Autonomous vehicles: the future of auto mobiles[8]	2021	Deep learning	This paper has provided 57% of accuracy rate by using deep learning technique	Autonomous vehicles are the way of future in developing sensor technology in order to achieve accuracy rate
09	Autonomous vehicles[9]	2021	Deep learning sensor Technology	This paper has come up with 86% of accuracy rate to achieve deep learning and sensor technology	It is achieved 86% of accuracy rate
10	Autonomous driving vehicle[10]	2021	Mobile communication	This paper provides developing a autonomous cars by using mobile communication	The ultrasonic sensors has been used in order to improve autonomous vehicles with good accuracy rates
11	Autonomous vehicles using sound information technology[11]	2021	Sound information technology	This paper has achieved 65%of accuracy rate in developing autonomous vehicles using sound information technology	The technology is applied for the development of autonomous vehicles to reach accuracy rate
12	Design of multi-functional autonomous car using ultrasonic sound and infrared sensor[12]	2021	Machine learning sensor technology	This paper has achieved more than 80% of accuracy rate on sensor technology	This provides a model of a autonomous cars which are able to provide multiple functions using machine learning
13	Autonomous vehicles: enabling[13]	2021	VANETS	Driving is made more safer and more reliable using VANETS	It provide long range technologies and future intelligent transport system
14	Model of autonomous car[14]	2021	Artificial intelligence	This proposed system has been developed with the help of machine learning and artificial intelligence in order to reduce number of accidents	This research papers provides different advancements and sensors to build autonomous vehicles
15	Smart phone controlled multi-purpose robot car[15]	2021	Image processing	This paper has achieved 60% of accuracy rate in image processing to develop autonomous cars	Self -driving car have a greater accident rate than driven human autonomous.
16	Autonomous car[16]	2021	Sensor technology and image processing	This paper has achieved an accuracy of 96%	It enables to perform multiple function based on sensor technology and image processing
17	Building the computing system for autonomous vehicle[17]	2021	Sensor technology	It provides 50% of accuracy to achieve sensor technology in order to develop the autonomous vehicle system	It achieves systematic understanding of autonomous vehicles end to end

18	Autonomous car using raspberry pi[18]	2020	Artificial intelligence	This paper has been successfully implemented in prototype of autonomous car using raspberry pi	Driverless car revolution aims at the development of autonomous vehicles for transportation without a driver
19	Multifunctional autonomous cars using infrared sensor[19]	2020	Artificial intelligence	This autonomous car successfully was able to detect the obstacles by 78% of accuracy rate	This paper was successfully reviewed 80% of accuracy rate
20	Autonomous car[20]	2020	Deep learning	Detected the vehicle with an accuracy of more than 80% in deep learning	This research paper gives an overview current vehicle technology
21	Multipurpose autonomous car[21]	2020	Convolutional neural network	Self-driving car accident accurate the rate of 8.1 per million miler driven compared to 3.1 per million for normal cars	This research paper gives advancements of using sensor technology
22	Autonomous vehicles technology[22]	2020	Sensor technology, image processing	This paper is achieved 45% of accuracy rate in sensor technology and image processing	It is outlined highlighted and investigated the technical measures the position of the objects
23	Self- driving cars a platform for loading and research [23]	2020	OpenCV and YOLOV3	It provides visual servo robustness using open CV and YOLOV3	This platform provides access to car technologies is use on autonomous vehicle
24	Autonomous multi-purpose vehicle for advanced robotics[24]	2019	Image processing	This robot can be used to track a position by image processing and obstacle detection	This robust accepts only voice control and hand gestures
25	Obstacle avoidance and path recognition of an autonomous vehicles[25]	2019	Sensor technology	This paper is achieved 30% of accuracy rate using sensor technology	Helps in developing and improving autonomous cars using sensor technology
26	Obstacles detections track detections in autonomous cars[26]	2019	Sensor technology and deep learning	This paper is achieved with above 50% of accuracy rate to detect obstacle and track detections using sensor technology	The sensor technology helps us to understand how sensors can be used to increase accuracy rates

In this paper, we have reviewed the work related to autonomous cars that provides an overview of the state of the art technologies, challenges, and trends in the field of autonomous driving. These papers typically cover a wide range of topics including perception, localization, planning, control and human-vehicle interaction. There are various sensors such as infrared and ultrasonic sensors that are used to detect obstacle detection, line tracking and human hand following.

Some of the key themes that are covered in survey papers on autonomous cars include:

1.Infrared sensor: This is a motion detector which detects objects and alerts using an alarm.

2.Ultrasonic sensor: By using ultrasonic sound waves, this instrument measures the distance between the objects.

3.Localization and mapping: This includes a review of the technologies used to measure the car's position and map the surrounding environment.

3. ADVANTAGES OF AUTONOMOUS

VEHICLES

- Eliminating human error: It is generally acknowledged that human drivers are to blame for around 95% of traffic accidents.
- More independence for the elderly and persons with disabilities: Self-driving cars provide people with disabilities who would not be able to drive independently more freedom and independence.

Possibilities for more effective driving: Even careful drivers occasionally have trouble parallel parking.

4. DISADVANTAGES OF AUTONOMOUS VEHICLES

- Cost: Autonomous vehicles are now more expensive than ordinary cars, and the cost of maintenance and repairs could potentially be greater due to the complex technologies involved.
- Cybersecurity risks: Since autonomous vehicles rely on internet and computer systems to function, they may be subject to cyberattacks.
- Employment loss: The widespread use of autonomous cars may result in job losses in sectors like transportation and driving.
- Ethical conundrums: Because autonomous vehicles are programmed to make decisions based on algorithms and data, there may be ethical conundrums when there isn't a clear right or wrong choice to be made.
- Despite major progress, autonomous vehicles still have some technical limits, including as handling bad weather and effectively recognising and responding to unexpected events.

5.CHALLENGES IN AUTONOMOUS VEHICLES DRIVING SYSTEM

- Traffic management
- Infrastructure
- Police and emergency response
- Revenue

6. CONCLUSION

In this paper, we have reviewed various works on autonomous car using IoT and uses various sensors for sensing an control unit for an action needs to be done. This robot structure is adaptive and can be enhanced to next level. The economy will benefit from increased fuel efficiency, the environment from less carbon emissions and increased social cohesion, and the legal system from a straightforward system of liability. In conclusion, research into the use of IoT in autonomous vehicles is a subject that is fast developing and has a great deal of potential to enhance the sustainability, efficiency, and safety of transportation systems. The utilisation of sensors, data analytics, and communication technologies are some of the most recent developments in the fields of autonomous vehicles and the Internet of Things that are highlighted in this survey report.

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