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SELF DRIVING VEHICLE WITH OBSTACLES DETECTION AND GPS TRACKING

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Abstract: Self-Driving Vehicle with Obstacles Detection and GPS Tracking" presents a groundbreaking approach to autonomous Snavigation. Integrating advanced sensors and GPS technology, the system enables real-time detection and avoidance of obstacles, ensuring safe and efficient transportation. By harnessing machine learning algorithms, the vehicle can adapt to dynamic environments, accurately identifying various obstacles such as pedestrians, vehicles, and road hazards. Additionally, precise GPS tracking enhances navigation accuracy, enabling the vehicle to follow designated routes with precision. This innovative solution promises to revolutionize transportation by offering a reliable and secure autonomous driving experience. With its robust obstacle detection capabilities and seamless GPS integration, the self-driving vehicle represents a significant advancement in autonomous technology, paving the way for safer and more efficient transportation systems of the future.

Keywords: Self-Driving, Obstacles Detection, GPS Tracking, Machine Learning Algorithms, Autonomous Navigation

I. INTRODUCTION

The transportation industry is undergoing a radical change thanks to the introduction of self-driving cars, which offer safer and more effective travel. This introduction explores how autonomous cars are utilizing cutting-edge GPS tracking and obstacle detection technology to usher in a new era of intelligent navigation. An advanced array of sensors, cameras, and radars are used by self-driving cars with obstacle detection systems to detect and analyze their environment in real time. These cars ensure safe navigation across complicated environments by properly identifying barriers like pedestrians, vehicles, and road dangers by utilizing advanced machine learning algorithms. Moreover, GPS tracking integration improves autonomous navigation systems' accuracy and dependability. GPS technology provides accurate route planning and navigation by continuously tracking the location and trajectory of the vehicle.

II. OBJECTIVE

- ❖ DEVELOP A SELF-DRIVING VEHICLE SYSTEM CAPABLE OF AUTONOMOUS NAVIGATION.
- ❖ IMPLEMENT ADVANCED OBSTACLE DETECTION TECHNOLOGY TO ENSURE REAL-TIME IDENTIFICATION AND AVOIDANCE OF OBSTACLES.
- ❖ INTEGRATE GPS TRACKING FOR PRECISE LOCATION MONITORING AND ROUTE OPTIMIZATION.
- ❖ ENHANCE SAFETY BY MINIMIZING COLLISION RISKS THROUGH PROACTIVE OBSTACLE DETECTION.
- ❖ IMPROVE EFFICIENCY BY OPTIMIZING NAVIGATION ROUTES BASED ON REAL-TIME GPS DATA.

III. LITERATURE SURVEY

A study of the literature on self-driving cars equipped with GPS tracking and obstacle detection would include a variety of studies, research articles, and technical reports that advance our knowledge of, ability to create, and enhancement of these kinds of systems.

Overview of Self-Driving Vehicles: The literature starts with a summary of the idea of self-driving cars and how important it is to change transportation and increase safety. Notable developments in the subject are emphasized, including the incorporation of sophisticated sensors, artificial intelligence systems, and GPS technology.

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Obstacle Detection Methods: A number of research examine the methods used by self-driving cars to identify obstacles. Among these are sensor fusion techniques that combine information from cameras, radar, and LiDAR to precisely identify impediments in the path of the car. Research studies frequently address the difficulties brought on by various environmental factors, such as bad weather and fluctuating light levels, and they suggest ways to improve obstacle detection ability in these situations.

A Brief Overview of Self-Driving Cars: The first section of the material introduces the idea of self-driving cars and highlights how important they are to transforming transportation and enhancing safety. Notable developments in the subject are emphasized, including the incorporation of sophisticated sensors, artificial intelligence systems, and GPS technology.

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IV. SCOPE

There is a great deal of potential for using GPS tracking and obstacle detection in cars. These technologies are essential for increasing traffic safety, increasing the effectiveness of transportation, and opening the door to autonomous mobility solutions. Vehicles are able to reliably navigate to targeted locations while detecting and responding to impediments in real-time because to the integration of modern sensors, artificial intelligence algorithms, and GPS technology. The scope covers a wide range of applications, such as public transit systems, business fleets for commodities delivery, and autonomous cars for personal mobility. The potential influence of these systems on the future of transportation is further increased by the prospects for more innovation and improvement presented by the ongoing developments in research and technology.

V. MACHINE COMPONENTS

- Components used
- Ultrasonic sensor
- lithium battery
- GPS sensor
- Iot modulation
- Power supply board
- Node MCU Wifi Module
- L298 motor drive board
- Dc Motor
- Diode
- voltage regulator
- Depositor
- LED lamp

VI. WORKING PRINCIPLE

The moving vehicle uses a variety of sensors, like as cameras, radar, and LiDAR, to identify obstacles nearby. These sensors record information about the environment around the car in real time, which is then processed by artificial intelligence algorithms to identify and categorize obstacles. Concurrently, GPS tracking technology is utilized to pinpoint the exact location of the car and guide it toward predetermined locations. By integrating these technologies, the car can safely and dependably operate in a variety of contexts by detecting impediments on its own, planning safe paths, and navigating with efficiency.

In order to detect obstacles in the route of the vehicle, a driving car equipped with GPS tracking and obstacle detection integrates sensors like as LiDAR, radar, and cameras. Real-time data from these sensors is processed by artificial intelligence algorithms to find impediments and create safe pathways. GPS tracking is utilized for accurate localization and navigation to targeted locations at the same time. The car can drive itself safely and effectively by avoiding barriers and following traffic laws by integrating GPS technology with obstacle detection.

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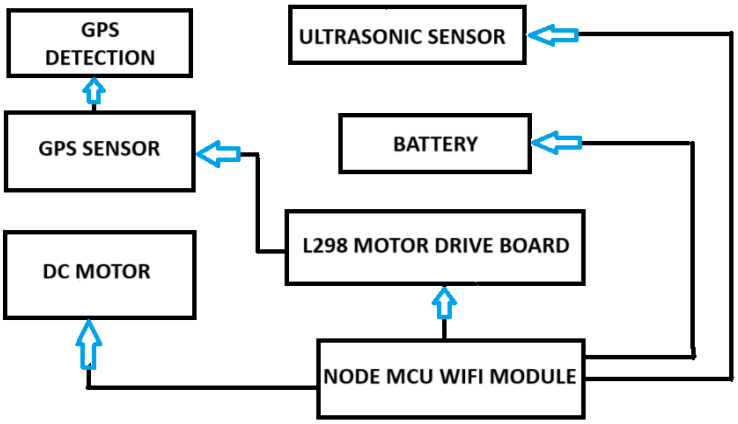
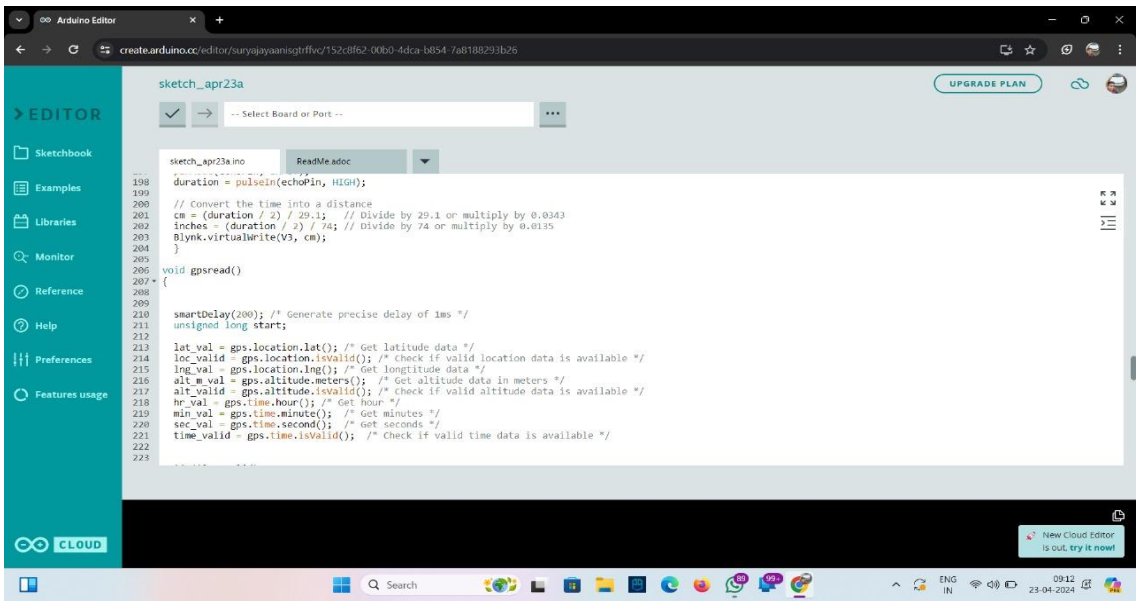
VII. MERITS

- Increased Safety: By identifying possible hazards promptly, obstacle detection systems lower the chance of crashes and accidents.
- Greater Efficiency: GPS tracking makes it possible to plan routes optimally, cutting down on fuel and travel time.
- Autonomous navigation: By combining GPS and obstacle detection, autonomous vehicles may drive themselves farther without the assistance of a human.
- Accurate localization, which enables precise navigation to desired destinations, is made possible via GPS tracking.
- Versatility: These systems are applicable in a wide range of fields, such as public transportation, logistics, and private transportation.
- Adaptability: Thanks to sophisticated algorithms, cars can dynamically modify their routes in response to on-the- spot traffic jams and obstructions.
- A more pleasurable and stress-free travel experience is provided to passengers by autonomous driving equipped with GPS tracking and obstacle recognition.

VIII. BLOCK DRAWING



IX. CODING



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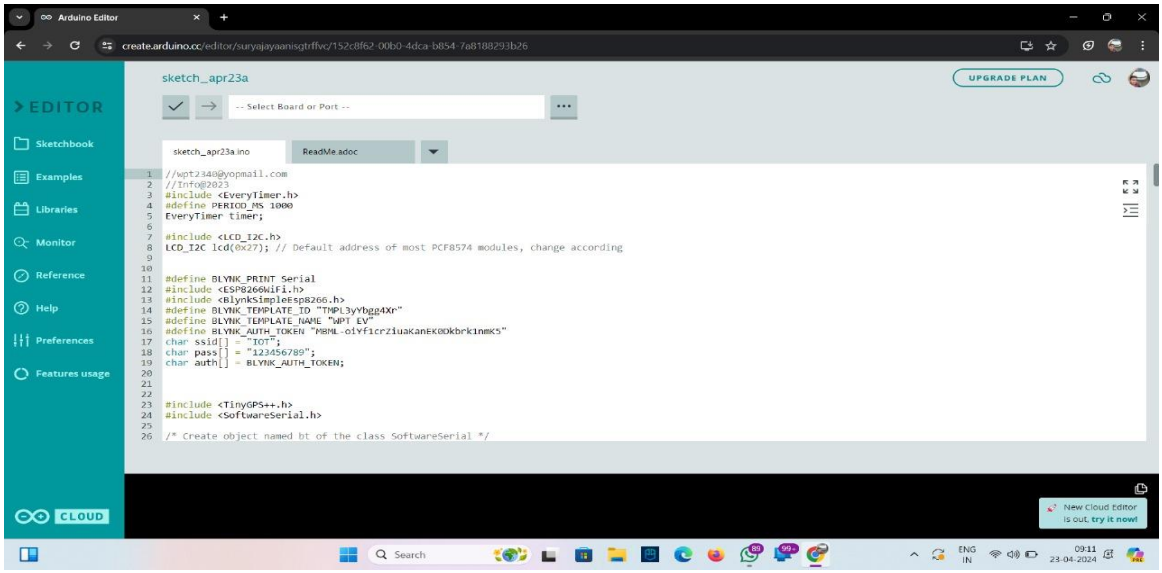

X. CONCLUSION

To sum up, the combination of GPS tracking, obstacle recognition, and self-driving technology is a big step forward for both safety and mobility. Combining these capabilities enables self-driving cars to navigate through intricate situations with increased awareness, resulting in safe and efficient travel while also reducing possible hazards. The incorporation of obstacle detection systems enables autonomous cars to promptly identify and react to a range of road hazards, including pedestrians, vehicles, and obstructions. By giving the car the ability to make wise decisions and take the necessary precautions to avoid collisions, this feature improves the safety of drivers, passengers, and other road users.

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