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A Driving Decision Strategy (DDS) Based on Machine Learning for an Autonomous Vehicle

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ABSTRACT

The driving strategy of a contemporary self-driving automobile is determined exclusively by considering things external to the vehicle (such as pedestrians, the state of the road, and so on), with the inner condition of the car being ignored. In order to solve the issues mentioned above, the author of this study developed a novel technique, which they called A Driving Decision Strategy (DDS) Based on machine learning for an autonomous vehicle" The most effective approach for an autonomous vehicle is determined via an analysis of both its internal and external components (consumable conditions, RPM levels etc.). In order to put this into action, the inventor of the project developed an algorithm known as the DDS (Driving Decision Strategy) algorithm. This method is based on a genetic algorithm to choose ideal gene values, which assists in making more accurate decisions and predictions. The DDS algorithm first gathered data from the sensor, and then it passed that information on to the genetic algorithm so that the genetic algorithm could determine the ideal value, which aided in quicker and more accurate prediction. The performance of the proposed DDS together with the genetic algorithm is compared to that of other machine learning algorithms already in existence, such as Random Forest and MLP (multilayer perceptron algorithm.). In comparison to random forest and MLP, the predictive accuracy of propose DDS is much higher.

KEY WORDS: Driving Decision Strategy (DDS), Multilayer Perceptron (MLP), Optimized Deep Learning Module (ODLM), Discrete aircraft, Segmentation

1. INTRODUCTION

Technology for sophisticated autonomous cars is presently in the fourth stage of development, and businesses all around the globe are hard at work producing the necessary components. The functioning of a self-driving automobile may be broken down into three stages, which are recognition, judgement, and control. Vehicles are outfitted with a variety of sensors, including as GPS, cameras, and radar, as part of the process of becoming recognized. The judgment stage is when a driving strategy is decided upon after considering all of this information. After the driving environment has been recognized, it will be analyzed, after which suitable driving plans will be established together with the goals. After the control stage has been finished, the vehicle will start moving forward by itself. An autonomous vehicle goes through a sequence of motions in order to go to its destination. These motions include recognising its surroundings, making decisions, and exercising control. When these steps are repeated, the vehicle's ability to do so becomes better. An increase in the number of these sensors might cause the electrical system of the vehicle to become overloaded. Data gathered by sensors in autonomous cars is processed by computers located within the vehicles themselves. As more and more data is calculated, a person's ability to assess and manage events quickly slows down as a result of cognitive overload. Because of these issues, the vehicle's steadiness may be put in jeopardy. Some research have produced hardware that is capable of doing deep-running processes inside of a vehicle, while other studies employ cloud computing to compute sensor data. This was done as a method of avoiding an overload of the sensors in the vehicle.

2. LITERATURE SURVEY

Applied Sciences, volume 8, issue 7 (July 2018), Y. N. Jeong, S. R. Son, E.H. Jeong, and B. K. Lee, "An Integrated Self-Diagnosis System for an Autonomous Vehicle Based on an IoT Gateway and Deep Learning,"

The purpose of this paper is to propose "An Integrated Self-diagnosis System (ISS) for an Autonomous Vehicle based entirely on an Internet of Things (IoT) Gateway and Deep Learning." This system will collect records from the sensors of an autonomous vehicle, diagnose itself and the interactions between its components through the use of Deep Learning, and then notify the driver of the results. The International Space Station is comprised of three separate modules. The first In-Car Gateway Module (In-VGM) collects data from in-vehicle sensors, such as media records from a black box, riding radar, and car control messages, and transmits each piece of data over each Controller Area Network (CAN) to the on-board diagnostics (OBD) or actuators with the help of the, FlexRay, and Media Oriented Systems Transport (MOST) protocols. This allows the data to be accessed by the on-board diagnostics (OBD The information gathered by in-vehicle sensors is sent to the CAN or FlexRay protocol, whilst the information gathered by media players while they are in use is transmitted to the MOST protocol. The different sorts of messages that have been transmitted are used to construct a message type known as a destination protocol message type. The second Optimized Deep Learning Module (ODLM) is responsible for the generation of the Training Dataset through the utilization of information obtained from in-car sensors. This module also calculates the possibility of car components and consumables, in addition to the possibility of other components being impacted by a faulty component.

To increase the speed of the self-diagnosis and reduce the device overhead, while a V2X-based Accident Notification Service (VANS) notifies the neighboring vehicles and infrastructures of the self-diagnosis result that was processed by the OBD. Using the In-VGM, the simultaneous message transmission effectiveness of this paper is improved by 15.25%, and using the ODLM, the mastering error price of a Neural Network method is decreased by around 5.5%. Both of these improvements are thanks to this study. "Discrete aircraft segmentation and estimation from a factor cloud utilizing neighborhood geometric patterns," Yukiko Kenmochi, LilianBuzer, Akihiro Sugimoto, and Ikuko Shimizu, "Discrete aircraft segmentation and estimation from a factor cloud," International Journal of Automation and Computing, Volume 5, Issue 3, Pages 246-256, 2008.

This paper proposes a strategy for segmenting a three-dimensional factor cloud into planar surfaces by making use of the findings that can now be derived from discrete geometry. In discrete geometry, a discrete plane is defined as a group of grid components that are situated between two parallel planes and are segregated from one another by a very small distance referred to as thickness. On discrete planes, in contrast to the situation of non-stop planes, there is a limited number of neighboring geometric designs to choose from (LGPs). In addition, as opposed to having only one regular vector, this kind of LGP includes a collection of regular vectors to choose from. We exclude non-linear factors from a factor cloud by making use of these LGP characteristics, and we proceed to classify non-rejected factors into a planar-surface-point set if their LGPs share frequent ordinary vectors.

"Vehicle trajectory prediction based entirely on Hidden Markov Model," by Ning Ye, Yingya Zhang, Ruchuan Wang, and Reza Malekian, published in The KSII Transactions on Internet and Information Systems, Volume 10, Issue 7, in the year 2017.

Intelligent Transportation Systems (ITS), logistics distribution, and mobile e-commerce may all benefit enormously from reliable, precise, and real-time predictions of vehicle trajectories.

The forecast of a vehicle's trajectory can now not only provide accurate location-based offerings, but it can also observe and foretell the conditions of site visitors in ahead of time, and then recommend the best path for clients to take. In this study, we begin by mining the double layers of hidden states contained inside previous car trajectories. Next, we make use of historic data to compute the parameters of the HMM (hidden Markov model).

Second, we discover the hidden country sequences with double layers that match to the simply pushed trajectory by using the Viterbi method. Finally, depending entirely on the hidden Markov model with double layers of hidden states, we give a brand new technique for vehicle trajectory prediction called the DHMTP. This strategy predicts the closest neighbour unit of function facts of the subsequent ok phases. When it comes to predicting the trajectories of the subsequent okay phases, the findings of the experiments show that the accuracy of the recommended algorithm's prediction is improved by 18.3 percentage points when compared to the TPMO approach and by 23.1 percentage points when compared to the Naive algorithm. This improvement is most noticeable when there is a greater flow of visitors, such as during the transition from weekday morning to evening. In addition, in comparison to the TPMO algorithm, the time overall performance of the DHMTP method is much improved.

3.PROPOSED SYSTEM

The author of this work is discussing the notion of a driving choice strategy by watching the steering and RPM level of the car to anticipate several classes such as speed (steering), changing lanes, etc. Every approach that was available only concentrated on exterior data, such as the state of the road and the number of people, and did not emphasize the importance of internal values. Therefore, the author is evaluating internal data in order to make an accurate estimate of the steering situation and the ability to change lanes. After collecting all of the internal data from the sensors and storing it on the cloud, the program will receive the data from the cloud and then use machine learning algorithms to identify or anticipate whether the steering state would change lanes or not.

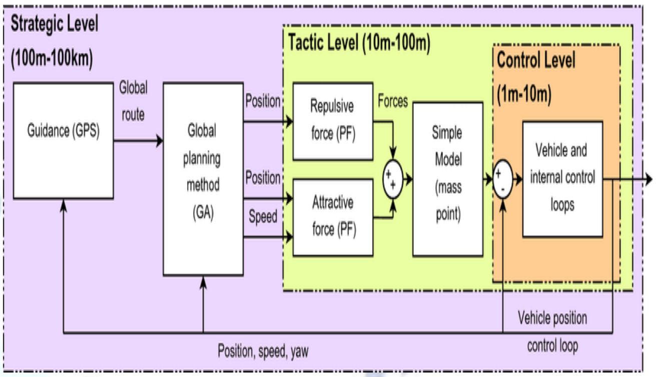

Figure 1: Architecture for Proposed System

4. RESULTS

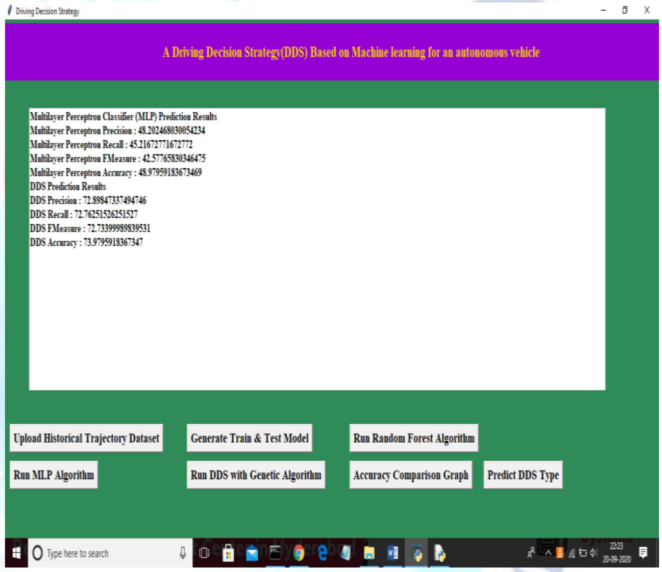

Figure 2: Accuracy of various algorithms

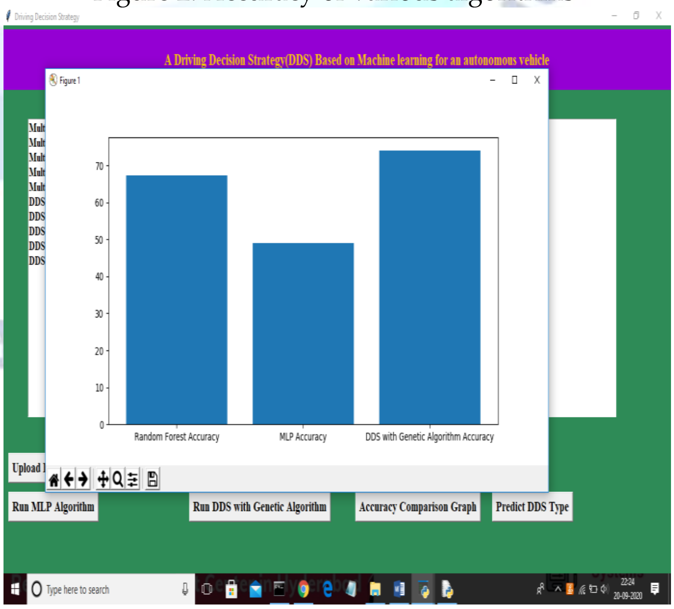

Figure 3: Graph for accuracy

5. CONCLUSION

In this study, we present a Driving Decision Strategy to help drivers make better decisions. It visualizes the autonomous vehicle's driving and consumables situations to offer drivers, and it employs a genetic algorithm based on collected data to determine the optimal driving strategy depending on the slope and curve of the road it is traveling on. Experiments reviewing data from an autonomous car were performed to prove the DDS's viability by identifying the best driving strategy. Comparatively accurate, the DDS is 40% quicker at determining the optimal driving approach. More importantly, DDS is 20 percent quicker at determining the optimal driving approach and is 22 percent more accurate than RF. The DDS is the go-to when precision and timeliness are of the utmost importance. Because the DDS just uploads the minimum amount of information required for a genetic algorithm analysis on the cloud, it can determine the best driving strategy for the car much more quickly than previous approaches. These evaluations were conducted in a simulated setting utilizing personal computers with subpar graphics processing units. In the future, it will be important to put DDS to the test in a real-world setting. Designers with experience in this area should also work to enhance the aesthetic elements.

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

REFERENCES

[1] Y. N. Jeong, S. R. Son, E.H. Jeong and B. K. Lee, "An Integrated SelfDiagnosis System for an Autonomous Vehicle Based on an IoT Gateway and Deep Learning," Applied Sciences, vol. 8, no. 7, July 2018.

[2] Yukiko Kenmochi, LilianBuzer, Akihiro Sugimoto, Ikuko Shimizu, "Discrete plane segmentation and estimation from a point cloud using local geometric patterns," International Journal of Automation and Computing, vol. 5, no. 3, pp. 246-256, 2008.

[3] Ning Ye, Yingya Zhang, Ruchuan Wang, Reza Malekian, "Vehicle trajectory prediction based on Hidden Markov Model," The KSII Transactions on Internet and Information Systems, vol. 10, no. 7, 2017.

[4] Li-Jie Zhao, Tian-You Chai, De-Cheng Yuan, "Selective ensemble extreme learning machine modeling of effluent quality in wastewater treatment plants," International Journal of Automation and Computing, vol. 9, no.6, 2012.