BATTERY OPTIMIZER MODE CONCEPT

Vrushabh Raju Dalvi & Nachiket Raju Dalvi

Research Scholar, Pune University, Maharashtra, India

ABSTRACT

The electric cars digitization is playing a key and vital role in developing new technology in the automobile market which is transforming the era of automobile sector. Thus, an automobile is changing at the rapid space which is determining the efficiency of automobile vehicles at each and every stage of this sector. Thus, the mechatronic system is playing a major role in determining the efficiency of automobile vehicles. To increase, the efficiency of cars it is necessary to tap the performance of automobile components and to digitize car efficiency according to the industry of 4.0. Thus, car efficiency and performance can be monitored to timely govern the speed and propel the efficiency of auto ancillaries. Thus, mechatronic system is majorly and widely playing a vital role in car efficiency and monitoring the speed at every interval which will enhance the efficiency of automobiles and will give the maximum output by programming the auto ancillaries part which will help to create a new phase of technology which will boost the automobile market. Thus, based on new generation expectation the technology is a key and important role to determine the market potential of electric vehicles and its adaptability according to the Indian market. To meet this benchmark it is essential to develop new digital technology which is a driving factor to propel the growth of the automobile industry.

KEYWORDS: Mechatronic System, Industry 4.0, Digital Technology, IOT

INTRODUCTION

In this new era of automobile vehicles, the electrification or the replacement of fuel is on verge which is going to be taken by electric car batteries. To increase the efficiency of automobiles the auto ancillaries part plays a vital role in transforming these technology and achieving the maximum efficiency. As the new technology are emerging in market which are targeting the performance and the digitization of automobile and car connectivity in which mechatronic technology plays a vital role in establishing new methods to car connectivity and improving car efficiency.

These future trends are setting up a new horizon to establish a strong platform which is driving the technological field and establishing a new milestone to upgrade the systems. The automobile market is becoming vibrant day by day and is establishing a new product portfolio which is governing the market future strategy and enhancing the electric mobility of automobiles. To enrich these techniques IOT is playing a major role in enhancing future mobility.

In India, car pulling or vehicle efficiency parameters are major and prime issues in which auto ancillaries component plays a significant role in it. The start-stop system and anti-brake locking technology are generally well

established and en-routed to achieve the maximum efficiency of car vehicles. In order, to increase the efficiency of automobile vehicle components the electronic system plays a significant role in these systems.

In today's automobile market, digital technology in electric vehicles plays animportant role in enhancing the efficiency of car output and sustainability of brands and features which are playing a unique role in thriving the efficiency of electric vehicles.

Concept

The battery optimizer concept is primarily based on optimizing system capability of electric automobiles. The main purpose of battery optimizer mode is to supply the required power based on the electric battery energy which is required to propel the car. E.g. the battery optimizer mode is use full when your car requires a certain amount of energy to achieve the required output.

The battery optimizer mode is basically used to navigate the speed of the car in order to achieve the resulted output. The battery optimizer mode is functioned mainly when the car is in moving condition. The following are the steps when the battery optimizer mode will function after engaging it into the system.

- The car will indicate the percentage of the battery which is left. At 30% of battery, automobile will indicate the charging of the battery to be required.

- The battery optimizer mode will function like a cruse control mode which will sense the speed and drive the car at the end of the destination of it.

- 3. After pressing the battery optimizer mode a probe will be connected to the internet which will detect the location on the highway and will search the nearest charging electric station.

- Based on the data which is obtained by the sensor, the battery optimizer mode will calculate the speed and will maintain that constant speed till it reaches its destination(i.e electric charging station)

- The only control the driver will have is the brakes which will help him to control or stop the vehicle.

Technical Database

In order to govern the system of battery optimizer mode, the closed-loop system is being established in a mechatronic circuit component unit. These closed-loop system basically will calculate the speed and required distance which will monitor at each stage untill it reaches its final destination.

This system is basically predetermined to govern the speed and car efficiency at the required output which is to be achieved by battery optimizer mode. The battery optimizer mode is set in and programmed according to it. Based on the frequency of the electric charging station the closed-loop system is to be programmed according to it. (E.g. if the electric charging station frequency in India is around 10 km, then the closed-loop system will calculate the speed and power which is going to be required to propel the car to achieve its required output.

These modes will indicate the power requirement when the battery charging is around 20-30% and you need the charging of your vehicle. These units will be connected to the battery system and will get engaged after a certain limit of battery percentage is being discharged. Thus, this mode will increase the efficiency of an automobile and will increase the comfort level at the user end.
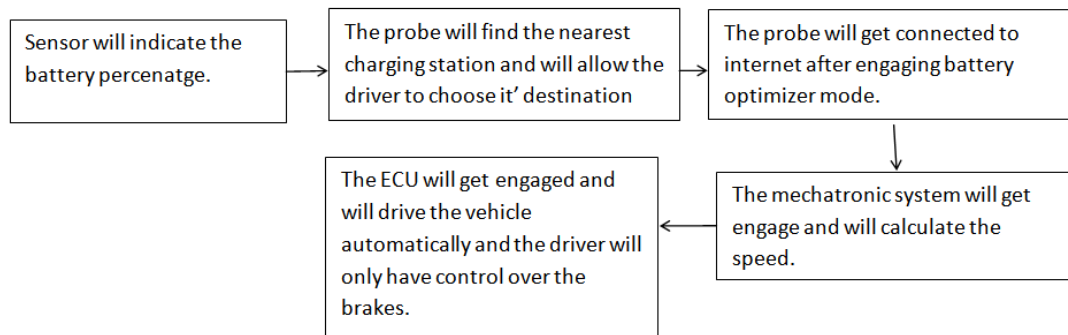
Block Diagram

Figure 1

CONCLUSIONS

In this era of Digitization, Smart and efficient future mobility play a key role in increasing the efficiency of vehicles and allowing them to Interact with the future technology which are upcoming in the market at rapid space. Thus, these smart features are essential to boost the car efficiency and to drive the future mobility. Thus, there are a conceptual and practical Product which can be easily implemented in-car systems. This concept is majorly focused on increasing the efficiency of vehicles and also to enhance the efficiency of automobile ancillary part.

REFERENCES

1. www.ijsrp.org/research-paper

2. https://ieeexplore.ieee.org/document/6176637/

3. F. Baronti et al., "Design and Verification of Hardware Building Blocks for High-Speed and Fault-Tolerant In-Vehicle Networks," IEEE Trans. Ind. Electr., vol. 58, no. 3, pp. 792-801, Mar. 2011

4. Manenti, et al., "A new BMS architecture based on cell redundancy,"IEEE Trans. Ind. Electron., vol. 58, no. 9, pp. 4314-4322, 2011.

5. J. Cao, N. Schofield, and A. Emadi, "Battery balancing methods: A comprehensive review," in Proc. IEEE Conf. Vehicle Power and Propulsion, 2008, pp. 1-6.

6. Mote, Tanuja P., Meenal R. Majge, And Gouri P. Brahmankar. "Mechatronics In Automobiles."

7. F. Baronti, et al., "State-of-Charge Estimation Enhancing of Lithium batteries through a Temperature-Dependent Cell Model," in Proc. IEEE Applied Electronics, Sep. 2011, pp. 1-5.

8. F. Codeca, S. Savaresi, and G. Rizzoni, "On battery state of charge estimation: A new mixed algorithm," in Proc. IEEE Int'l Conf. on Control Applications, Sep. 2008, pp. 102-107.

9. DRIEMEYER-FRANCO, Ana-Lucia; LUCEA, Marc; SAINT-MARCOUX, Antoine; BUI-VAN, Anh-Linh; PERICHON, Pierre, "SYSTEM AND CORRESPONDING METHOD FOR ESTIMATING THE CHARGE STATUS OF A BATTERY"

10. S. Piller, M. Perrin, and A. Jossen, "Methods for state-of- charge determination and their applications," Journal of Power Sources, vol. 96, no. 1, pp. 113-120, 2001.