"EV BATTERY EHANCEMENT USING ANN"

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ABSTRACT:

Electric vechiles play an important role in automotive industry .The Electric vechiles are belived to be the next revolutionary phase .The system will determine the range of the battery usage using the implementation of Deep Learning .The system will learn from the past expriences how to efficiently use the battery. It ensures that the battery is well optimized according to the usage. Here the ANN monitors the thermals of the battery and it dertermines the amount of power is supplied to the engine. With the help of Deep Learning technique the consumption of the battery is reduced and the life time of the battery is increased. with the help of Deep Learning technique the amount of charging discharging cycle decreases .

INTRODUCTION:

once a battery is fully charged , the charging current has to be dissipated somehow ,the result is the generation of heat which is bad for the batteries. the essence of good charging system is to be able to detect when the charging is required for battery and when the discharge process has to be done for maintaining good battery temperature within its safe limits. Detecting this stopping point and terminating charging is the most important processing preserving the battery life.

When the battery undergo charging and discharging cycle every time the efficiency of the battery gets degraded so here comes the implementation of Deep Learning . which uses the implementation of ANN to optimize the efficiency of the battery by using NEURAL NETWORK.

The machine understands the usage of e-vechile and the consumption of battery according to the users need and learns accordingly to the usage and try to improve the battery range, efficiency, thermals and charging.
The increase in temperature decreases the life time of the cells and is the main cause of accelerated aging . For best battery operation it is adivised to use batteries under the temperature 20 to 40 degree. So the ANN is implemented to increase increase the life time and efficiency of the battery.

DATA PREPOCESSING:

The Data preprocessing is the techinque of collecting and user data's are made error free before the data's are trained. IN this method the datas are made error free,so that the result obtained is more accurate.

USER IDENTIFICATION AND VALIDATION:

To identify the user fingerprint sensor is used.The fingerprint sensor is rightside handle of the car.When the user verifies the sensor the system identifies the name of the user,driving license,ageand at what range he/she drives a car regularly. The Artifical neural network[ANN] are trained using the training set. Here the finger print of the user is used to determine the type of user. The [ANN]is trained by the different images of the fingerprint and its is used to identify the user.here the [ANN] classify the images given by deciding wether it is the autorised user or not. If the [ANN] incorrectly identifies the input its uses the technique of Back Propagation to adjust to what it has learned during the learning time. The process of Back Propagation is done by the fine adjustment of the weights in the connectiions of the [ANN]. This process continues unless the [ANN] identifies the correct user with less possible error rate.

If the user is the new learner the system identifies it and learns from it the experience and sets the approx settings according to the condition such as school zone , highway , junctions and checkpost etc.

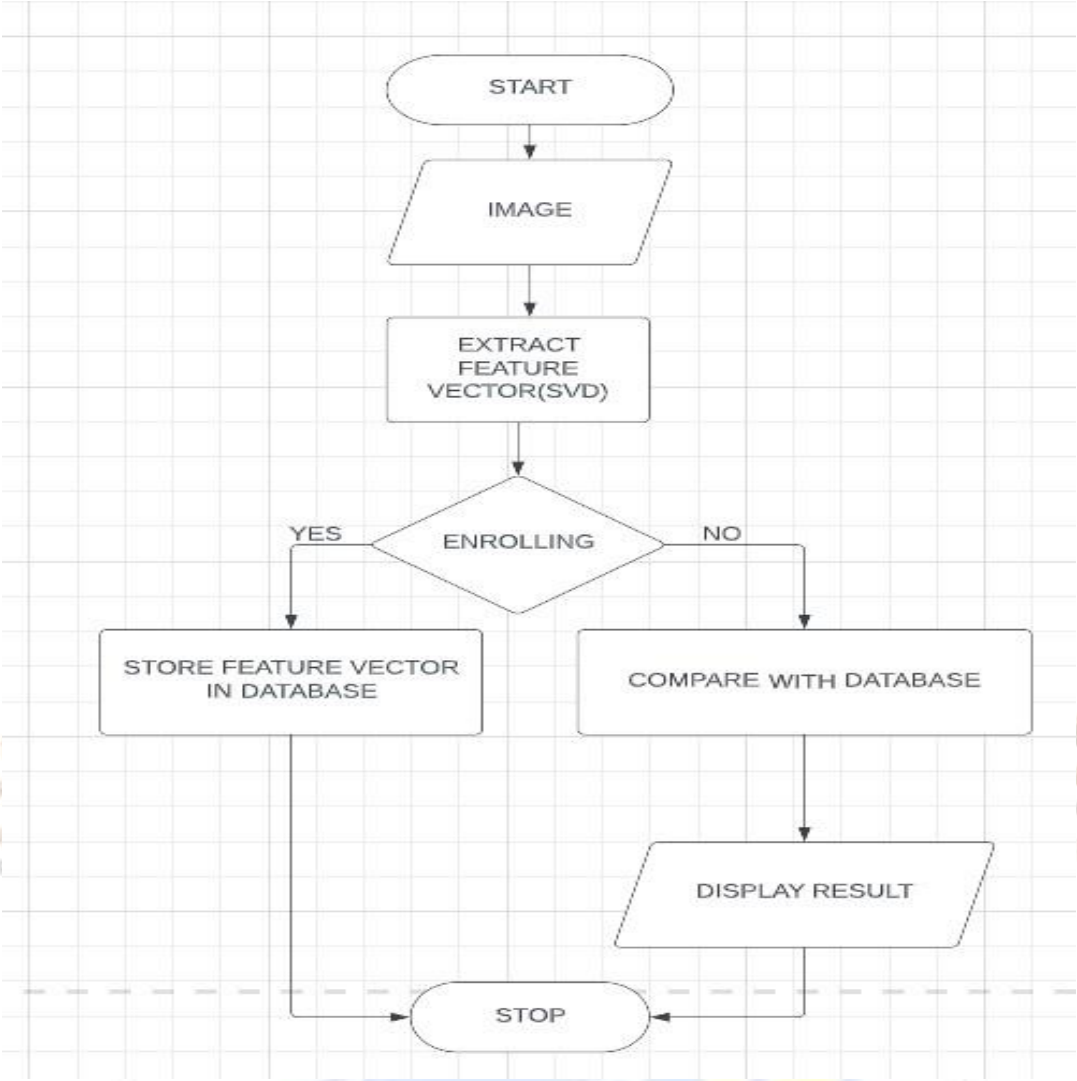

FIGURE 1: FLOW CHART FOR THE USER IDENTIFICATION USING FINGER PRINT SENSOR.

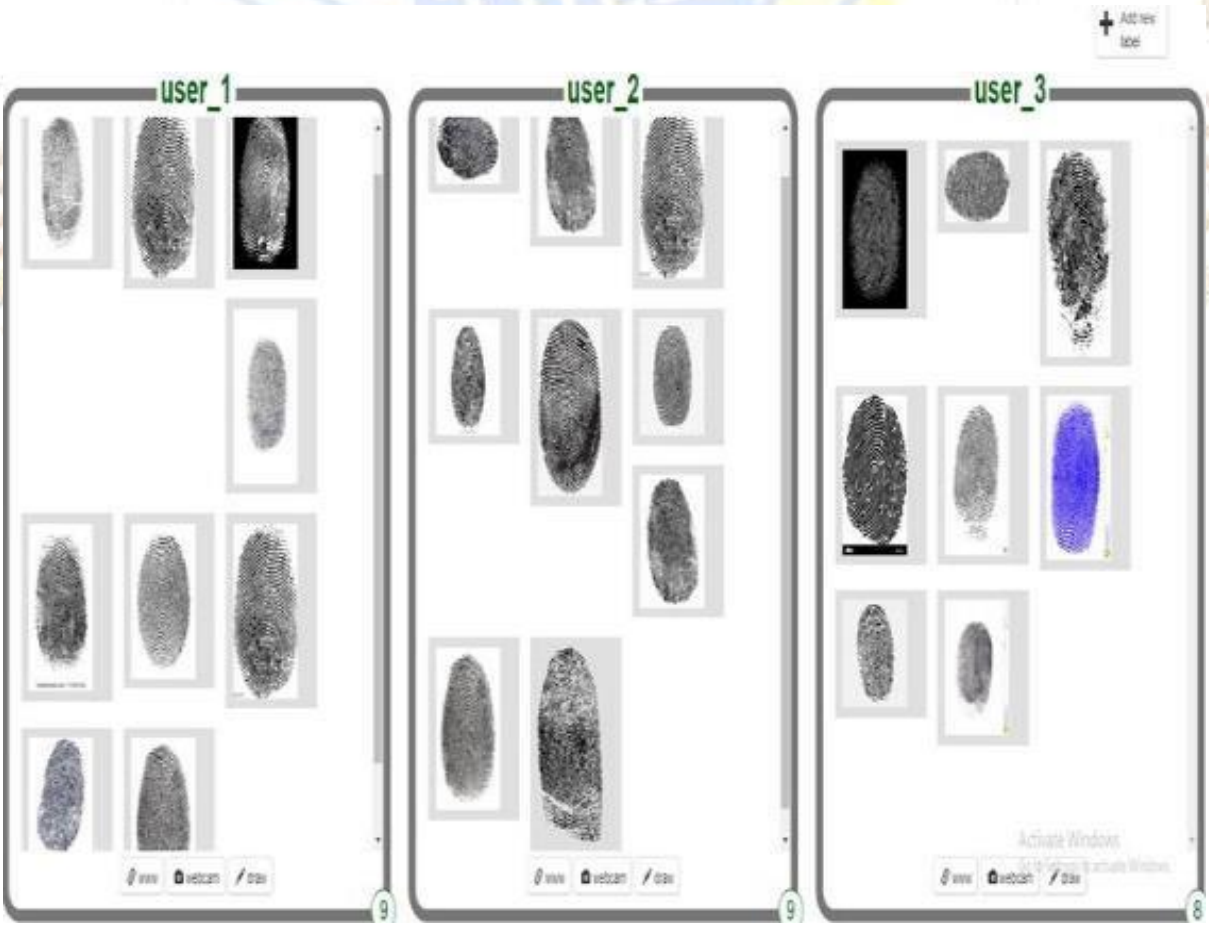

FIGURE 2: USER IDENTIFICATION USINF THE FINGER PRINT SENSOR SAMPLES.

FIGURE 3: REPRESENTS THE RESULT OF THE USER FINGER PRINT RECONISED

PLACEMENT AND IMPLEMETATION OF FINGERPRINT SENSOR:

The fingerprint sensor is placed in the handle of the ELECTRIC Vehicle which is used to identify the the type of user.When the input data goes into the

ANN network , the system senses the user and applies the most preferred feature and improves the user experiences.

Deep learning technique:

Deep learning is a subbranch of Machine learning which uses neural network which consists of multiple or single layer. These neural network are similar to the human brain as they are inter-connected with each other as neurons in our brain. when the input data enters the Neural Network it is the Neural Network is able to adapt and learn from the given input data. Large data sets can be used to train the deep learning algorithm to identify the patterns and generate high accurate peridiction accordingly. The accuracy of the Deep Learning algorithm is more efficient than the Machine Learning .the different types of Deep Learning algorithms are convolute neural network[CNN] , Artifical neural network[ANN],etc.

ARTIFICIAL NEURAL NETWORK:

The Artificial Neural Network are similar to the neurons which are present in our brain. The [ANN] contains the artificial neurons which are called as units. These units are stacked together in layer which builds the whole [ANN] system. These layers contains millions and millions of units which are based on the complexity of the system. The input given by the user first passes through the input layer and through the hidden layer where the data's are transformed to valuable for the output layer and finally the output layer produces the output in the form of response to the input data given .

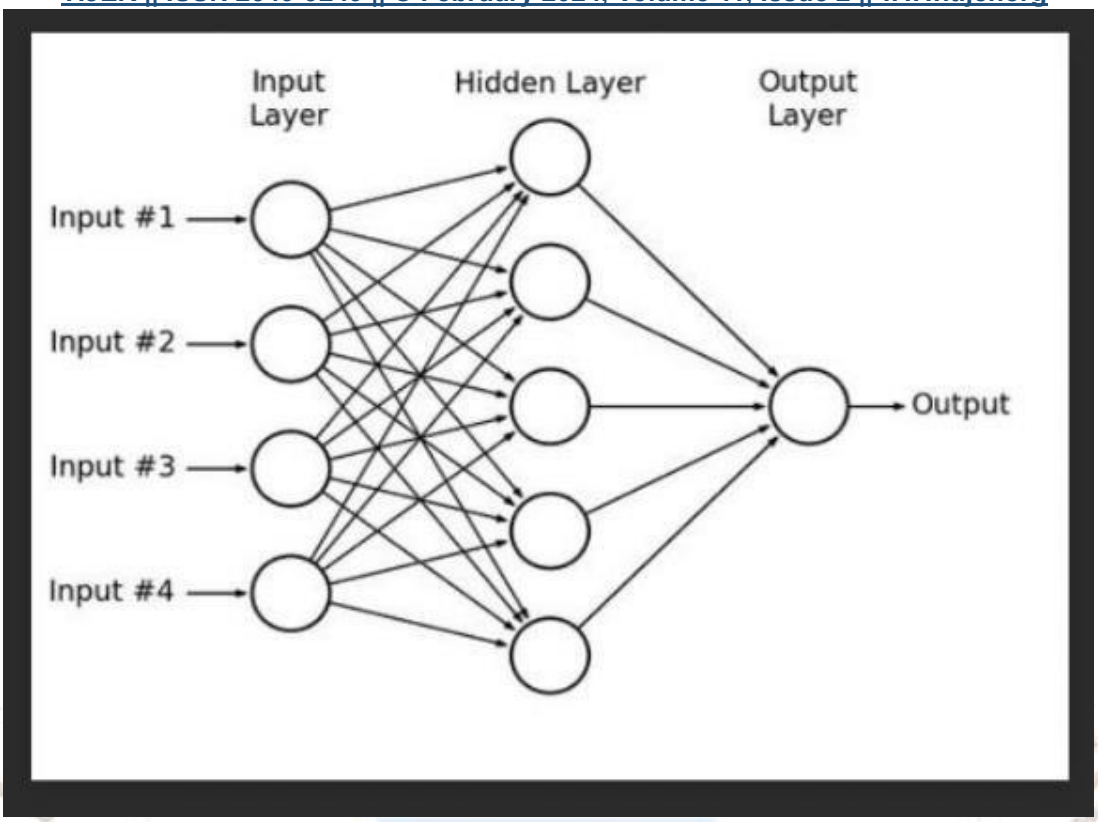

FIGURE 4: ARITIFICIAL NEURAL NETWORK.

BATTERY CONSUMPTION ENHANCEMENT:

To enhance the battery consumption the [ANN] is implemented here. When the type of user is determined the battery consumption is also adjusted or adapted to which type of user uses the EV car . The useage of the EV is different and independent on the type of user who uses the car. Here the useage of the EV for different user is learned and adapted accordingly.

[1] HOW THE USER USEAGE EFFECT THE BATTERY PERFORMANCE :

Every user does not use the EV car similarly. some may like to use the Ev in only sports mode and may some may like to use the EV for only a short run and there are many other type of users. So here in these usage the full efficiency of the battery is not needed based on the usage. By the use of [ANN] it identifies the type of user and only the certain percentage of the battery is only used according to the useage.

When only a certain percentage of the battery is consumed according to the user the life time of the battery increases and the amount of charging and discharging cycles reduces.

[2] HOW THE LOCATION EFFECT THE BATTERY USAGE :

The current location where is travelling is also taken into account in the [ANN] Neural Network. Here the system takes the current location of the the EV and the battery is utilized accordingly.

When the car enters into a highly traffic are or a school zone the full efficiency of the battery is not required , so the battery performance is limited and the power going into the engine is also limited so that the life time of the battery is increased.

[3] BATTERY THERMAL MONITERING :

When the battery is used continuously the heat is generated and the efficiency of the battery is also reduced. Get info on the battery temperature as well as other check including the outside temperature, the battery's state of charge (SOC), and current and voltage readings from the EV's installed sensors. The ANN will be developed and tested using this data.

Cleaning and normalising the collected data is pre - processing. To guarantee consistent inputs for the ANN, remove any outliers or noise and scale the data to a common range.

Choose the ANN's most vital attributes or inputs. SOC, battery temperature, ambient temperature, and current/voltage measurements are a few examples. To make the ANN less sophisticated and less computationally intensive, feature selection is critical.

Create training and validation sets from the preprocessed data. The ANN will be trained using the training set, and the validation The termals of the battery are monitered by the system when the temperature exceeds the safer limit the [ANN] overcomes this problem reducing the amount of power going into the engine and the EV runs in a low power mode. And this process increases the battery life and performance.

[4] POWER SAVING MODE :

When the battery percentage falls to the least limit the [ANN] reconises the drop in the battery and automatically switches to the power saving mode and when the user is using the EV in maximum performance the performance is limited and the power is consumed and the range of the battery increases.

[5] AUTOMATIC POWER LIMITER :

When there is unwanted usage of the battery the system senses and the performance is limited or turned off. When it is a day time and the head light is turned ON the system reconises it and the the light is turned off ,its is achived using the camera. When the window is open and the AC is running the AC is turned off and once the window is closed the AC is turned ON automatically . These processes are to improve the battery performance.

The following flow chart explains the process of the system:

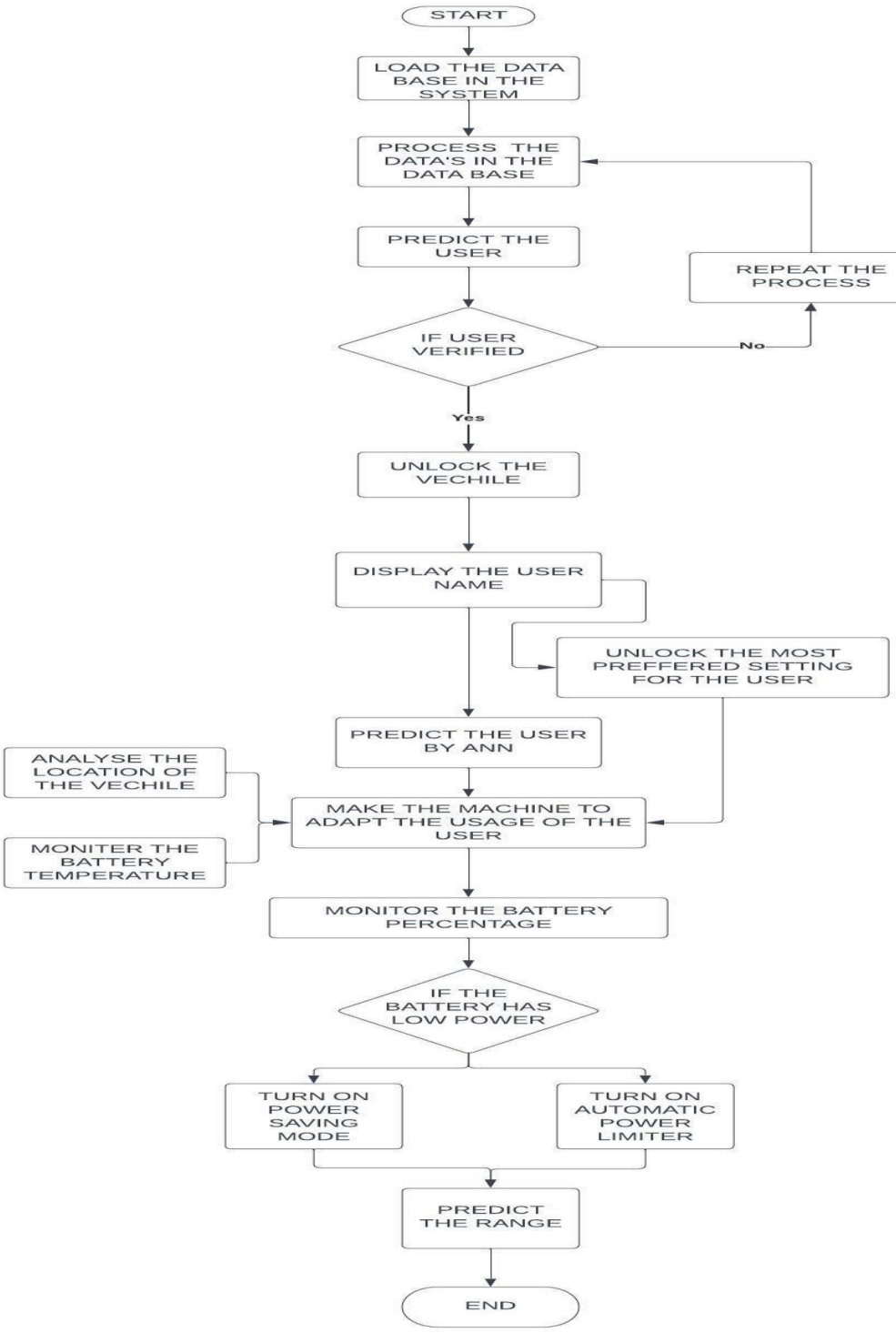

FIGURE 5: THE FLOW CHART SHOWS THE IMPLEMENTATION OF ANN FOR THE ENCHANCEMENT OF THE EV- BATTERY.

CONCLUSION:

In conclusion, employing artificial neural networks (ANN) to increase battery power is a potential approach to overcoming the problems caused by the short battery life of portable electronic gadgets. Our study showed that by modifying various system factors, ANN-based algorithms may be used to accurately anticipate battery performance and optimise energy utilisation. Our tests have demonstrated that the suggested ANN-based battery optimisation strategy can greatly lengthen the battery life of electronic devices without degrading the system's performance. The implementation of ANN-based battery optimisation techniques in different portable electronic gadgets will help to extend their total battery life, improve user experience, and lower the price of battery replacements. We think that this study will stimulate additional research on battery optimisation.

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