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AI Driven Planetary Bot for Future Vision

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ABSTRACT

These days focus is more on technologies like Artificial Intelligence, Machine Learning and IoT. There is lots of platforms available for IOT implementation. ESP8266 chip is among them Here the implementation is about prediction of different aspects of weather data that can be used in many ways like predicting the future condition of different region of earth or predicting future condition of different planets and their different regions. To implement this system, we need different sensors like pressure sensor humidity sensor, temperature sensor and a light intensity sensor i.e DHT11 is utilize for temperature and humidity data together and LDR. Is for light intensity. The data which is sensed by different sensors are than uploaded to Thingspeak which is an API for cloud server by the help of NodeMCU and then converted to csv format. The data can be used for monitoring the real time values too. Machine Learning Environment can be setup by the help of a CNN model. Training of model can be done by recorded values of sensor data. After recording data from sensors to NodeMCU like temperature, pressure, humidity and light intensity and after these values are sent to python environment that is Jupyter notebook for further analysis. Here the data which is used is real time data to predict the particular value and test the model.

Keywords: Machine Learning, CNN, Artificial Intelligence, IOT

I. INTRODUCTION

Is there any possibility of living on another planet or can we survive on another planet in future? How can we know that whether the conditions becoming favorable for our survival or not? The pressure is prefect there or it's changing continuously or temperature is becoming more colder there day by day? Answer to this type of question can be given by concept of AI with IoT together.

To develop this kind of system we required some hardware components like a microcontroller connected with different sensors which can send

their data to cloud by communication interface. That data later is utilized by AI environment for training, monitoring and analyzing purpose. The microcontroller can also take some decision based on analytics and what control information got from it. Here in the proposed system the microcontroller used is NodeMCU (ESP8266) which support the Wi-Fi facility for connectivity. Here the API we will use to support cloud is ThingSpeak for monitoring the data what we collected from different sensors. The CNN model is than trained with real- time values of data of humidity, pressure, temperature and intensity of light. Later, it will be used for prediction purpose.

II. LITERATURE SURVEY

A system is developed by Jitcha Shivang which is used for predicting future weather for subcontinent part of India. He used linear regression algorithm which is a machine learning algorithm. For training model, he collected data from government website portal that is data.gov.in. [1]

Different information collecting method is utilized by Zaheer Ullah Khan for determining climate condition by using different algorithms like KNN and decision tree. Among both decision tree is providing better accuracy compare to KNN which is 82%. [2]

Siddharth S uses decision tree and information mining technique together to get an idea about group climate parameter like extreme value, least value or average value of day, months and different years. [3]
Climate forecast paper is presented by Radhika which uses Support Vector Machines algorithm. In these she is predicting the extreme values like highest and lowest value for different time slots. For a particular region it predicting the highest and lowest temperature, pressure, humidity and different parameters according to different given time. [4]

Divya Chauhan published survey paper on weather prediction system that which technology we can use to made our system efficient and the different functionality of some already proposed system that which algorithm they used and which have high efficiency. What we can do to make our model more effective and what further improvement can be done in future to develop a new advance system. This survey paper cover all most all pros and cons of different implemented system and a complete research on what is done till now in this particular field and what can be done in the future. [5]

After considering all papers it can be concluded that all the system till now implemented used the data from other source that is the training and testing data is collected from outer source which shows the dependency of data for the model that without outer help the system is not possible but in our system everything data is collected from our system only. The data which is collected from our system is only use to train our model which results more accuracy and the scope of uses of our system is more as compare to other system.

III. HARDWARE REQUIREMENTS

NodeMCU - It is a microcontroller which provide the functionality of Wi-Fi connectivity. As compare to other module it is more cost effective.
DHT Sensor - It is utilized to measure humidity and temperature. In one sensor both thermistor and capacitive humidity is embedded together to measure both parameters.
LDR Sensor - By using principle of photoconductivity, the LDR sensor is used to measure light density of their surroundings. In light LDR resistance increases and in dark its resistance decreases.
Breadboard - It is a device without any solder, generally use for making connection among different components using wires. Wire connected

to components are put into small sockets of bread board to connect with other components. In proposed system sensors and NodeMCU are connected through Breadboard using wires.

IV. SOFTWARE REQUIREMENTS

Arduino IDE - Writing, compiling and uploading the code to Arduino or its compatible board is done in Arduino IDE Software which is an integrated development environment.

ThingSpeak API – This API is used in IOT for collecting and storing the data in the cloud.

Jupyter Notebook - It is a very famous platform to provide Python environment and to support technology like TensorFlow, Keras etc. to give the capability of Artificial Intelligence and Machine Learning to system.

V. SYSTEM IMPLEMENTATION

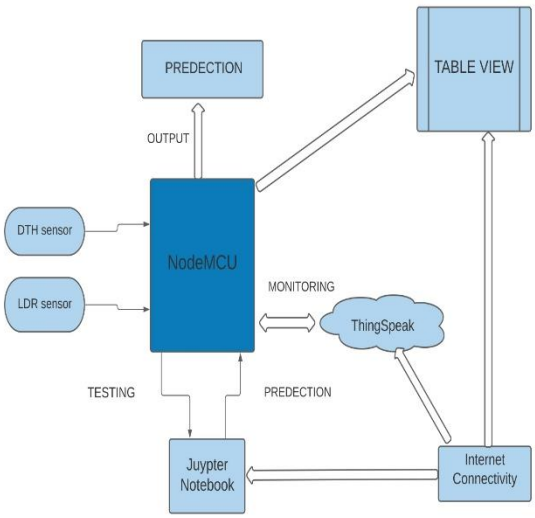

Fig: 5.1 Architecture of AI Driven Planetary Bot for Future Vision

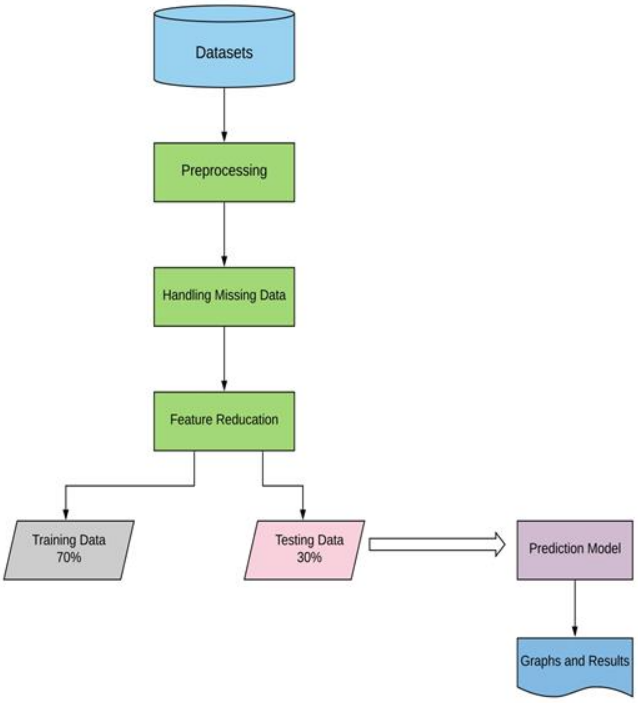

Fig: 5.2 Data Flow Diagram

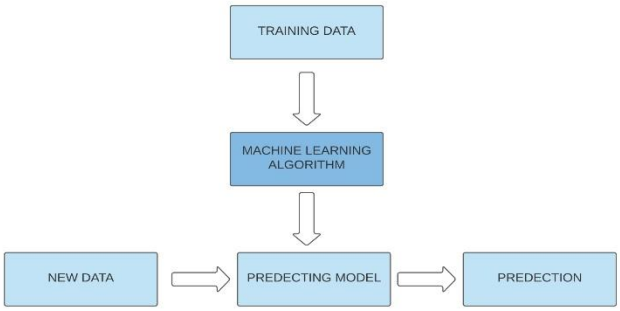

Fig: 5.3 Machine Learning Analysis

VI. IMPLEMEMTATION

For measuring pressure, humidity, temperature and other parameters different sensors are connected to NodeMCU like LDR sensor is attached to analog pin of input/output and remaining sensors are attached to digital pins of input/output. Once data is collected from different sensors to NodeMCU it is than converted to google spreadsheet which is a file of csv format by the help of API. Even we can keep record of these recorded data for monitoring and analyzing the

data. After successful file conversion this csv file is send to Juypter notebook or by importing the file to Juypter notebook from webserver we are ready to analyze the data. Juypter Notebook will provide the python environment to implement AI technology where we will use the data to train our CNN model. In Jupyter notebook many inbuilt libraries and packages will be used to perform necessary task like pandas, matplotlib, scikit learn, TensorFlow etc. for plotting, training and analyzing data. By the help of TensorFlow and keras lib we will import CNN model for training where we will train our model for 50 epochs. Training of model is done by the 70% of data and rest 30% will be kept for testing purpose. Once training of AI model is completed testing of that model will be done by the help of 30% testing data to get the accuracy of the model. We achieve the accuracy of 87% in these models which is more than any previous systems. Now by keeping our model in different environment of different planet we can predict the value of parameter like temperature, humidity, light intensity or pressure of that environment.

VII. RESULTS

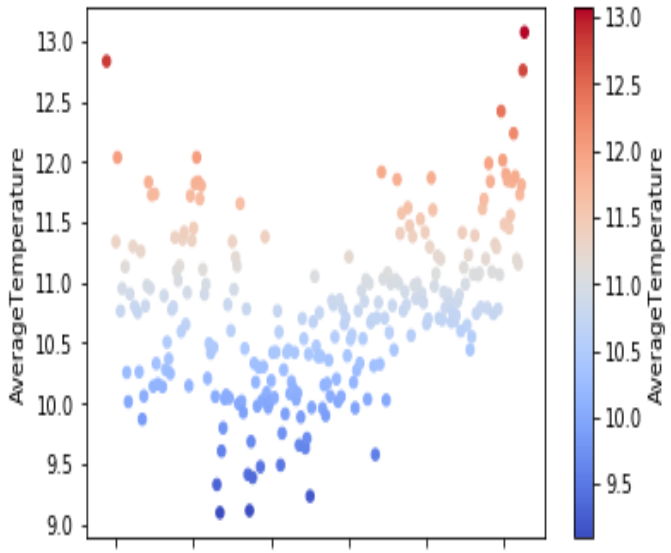

Fig: 7.1 Scatterplot representation of average temperature in different years

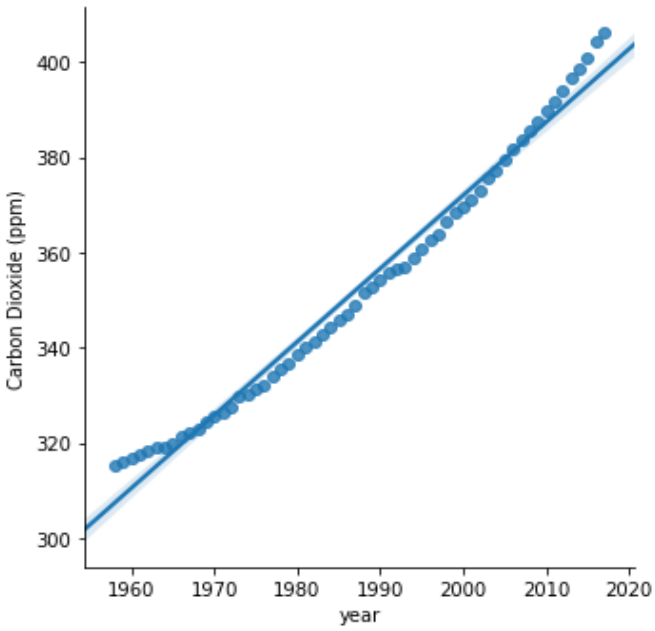

Fig: 7.2 Line plot representation and prediction of Co_2(ppm) in different year

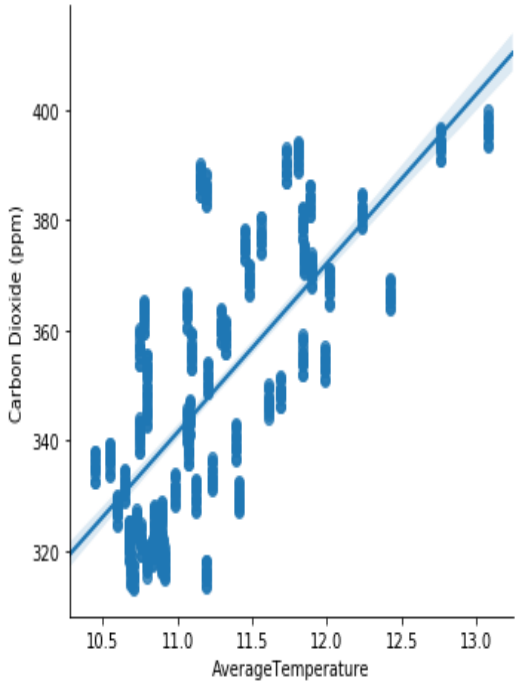

Fig: 7.3 Line plot representation and prediction of Co_2(ppm) with different average temperature

VIII. CONCLUSION

Our future parameters prediction system proposed here is going to predict the future aspect of different planets or different regions of our planets which going to provide the conclusion that whether in future there is any possibilities of survival in other planets or whether their weather going to change which is favourable for life existences. Even it can predict the temperature, pressure or humidity of any given surrounding that is different region of our planets also so that we can get idea of future condition of our planet too. This can be done by just keeping our system in concern region were is collect data like temperature, pressure, humidity and light intensity and by the help of AI trained model it will tell the future aspects of that region which is very helpful for many purposes.

IX. REFERENCES

[1] J. Shivang, S. S. Sridhar, "Weather prediction for Indian location using Machine learning," International Journal of Pure and Applied Mathematics, vol. 118, no. 22 pp. 1945-1949, 2018.

[2] Z. U. Khan and M. Hayat, "Hourly based climate prediction using data mining techniques by comprising entity demean algorithm" Middle-East Journal of Scientific Research 21, vol. 8, pp. 1295-1300, 2014.

[3] S. S. Bhatkande1, R. G. Hubballi2, "Weather Prediction Based on Decision Tree Algorithm Using Data Mining Techniques." Belgaum India: International Journal of Advanced Research in Computer and Communication Engineering, vol. 5, no.5, pp. 483-48, 2016.

[4] Y. Radhika, and M. Shashi, "Atmospheric temperature prediction using support vector machines." International Journal of Computer Theory and Engineering 1.1, vol. 1, no. 1, pp.1793-8201, 2009.

[5] D. Chauhan, J. Thakur, "Data mining techniques for Weather Prediction:" International Journal of Computer Science Trends and Technology (IJCST), vol. 6, issue 3, pp.249-254, 2018.

[6] S.S. Badhiye, B. V. Wakode, P. N. Chatur, "Analysis of Temperature and Humidity Data for Future Value Prediction" International Journal of Computer Science and Information Technologies, vol. 3, no.1 pp.3012- 3014, 2012.

[7] F. Olaiya, Adesesan Barnabas Adeyemo, "Application of Data Mining Techniques in Weather Prediction and Climate Change Studies", IJCSNS International Journal of Computer Science and Network Security, vol.17, no.6, pp 22-25, 2017.

[8] G. J. Sawale, S. R. Gupta, "Use of Artificial Neural Network in Data Mining for Weather Forecasting", International Journal of Computer Science and Applications vol. 6, no.2, pp.383-387, 2013.

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