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Air Quality Forecast Monitoring and it's Impact on Brain Health based on Big Data and the Internet of Things

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Abstract - *Air quality pre-observing has become a critical need, and this is an arrangement of complex building. From the point of view of keen basic leadership dependent on enormous information, the wise air record expectation is presented, the prevalent characterization calculation is presented, the shrouded data of chronicled information is mined, and the cerebrum wellbeing quality forecast is figured it out. The mind wellbeing quality checking framework dependent on the Internet of Things is developed, and the characterization calculation is utilized to acknowledge constant securing, canny preparing of information. So as to improve the information preparing pace and upgrade the continuous presentation of cerebrum wellbeing quality forecast, this paper acquaints distributed computing innovation with quicken information handling. So as to empower clients to comprehend the air file, whenever and anyplace, it is likewise structured dependent on the issue of enormous recorded information of air file and constant information assortment. The Android stage builds up an air record estimate customer.*

Key Words: **Brain health quality, intelligent forecasting, air quality forecast monitoring, big data, Internet of Things.**

1. INTRODUCTION

In the utilization of enormous information innovation and administrations during the time spent current natural insurance and biological human advancement development, we can sensibly utilize huge information to tackle some troublesome issues in ecological assurance work: 1) information exposure and information assortment; 2) air quality early cautioning and expectation; 3) utilizing huge information securing innovation to break down the reasons for ecological contamination. The information examination exercises are completed by consolidating different sorts of natural pointers and discharge data of contamination sources. Through logical investigation and sensible expectation of big business sewage power, dispersion of contamination sources and its effect on the encompassing condition quality, in light of this, the ecological treatment plan is defined, and the impact of natural treatment is observed routinely, and the treatment plan is always improved. The improvement and use of enormous information innovation can be said to give another approach to human to manage ecological issues. For earthy people, it is important to effectively advance the sound use of enormous information innovation in the field of ecological insurance.

1.1 INTERNET OF THINGS

IoT platforms can pinpoint exactly what information is useful and what can safely be ignored. This information can be used to detect patterns, make recommendations, and detect possible problems before they occur. Use sensors to detect which areas in a showroom are the most popular, and where customers linger longest; Drill down into the available sales data to identify which components are selling fastest; Automatically align sales data with supply, so that popular items don't go out of stock. The information picked up by connected devices enables me to make smart decisions about which components to stock up on, based on real-time information, which helps me save time and money. With the insight provided by advanced analytics comes the power to make processes more efficient. Smart objects and systems mean you can automate certain tasks, particularly when these are repetitive, mundane, time-consuming or even dangerous.

2. PROBLEM DEFINITION

Neural Network for Air Quality Prediction was introduced in 2018 by Widya Mas Septiawan [2]. Air pollution currently occurs in developed and developing countries and can disrupt environmental conditions and public health. Determining the level of air pollution (air pollutants) or air quality can be seen from a group of sensitive parameters such as NO2, O3, PM10, PM2.5, and SO2. This study predicts data on air pollutant concentrations over time (time series data) to determine future air quality conditions that are good or bad for health and the environment. Data predictions can use algorithms from artificial neural networks, one of which is the Back propagation Through Time (BPTT) algorithm. BPTT is a learning algorithm developed from the back propagation algorithm that is applied to the Recurrent Neural Network (RNN) network architecture.

Monitoring Indoor Air Quality was mentioned in 2018 by Phattaratorn Lismore et al. Poor Indoor Air Quality (IAQ) is an issue of environmental health problems that cause headaches, fatigue, irritation of the eyes and skin. IAQ in hospital areas is a serious concern since there are many occupants i.e. patients, medical practitioners, and staffs. Furthermore, medical material, medicine, medical gases can cause the quality of air deteriorate. IAQ then requires to

regularly check the service areas in order to maintain a good level of air quality.

3. PROPOSED WORK

To make a kit which will be installed in the required location for monitoring. The kit will basically include Arduino, on which all the sensors will configured and Wi-Fi module for data transfer. Collect the respective pollution readings after certain time interval. All the readings recorded by the kit will be transferred to the main station (server) by Wi-Fi module. Readings from all the kits will be recorded and saved into the database at the server end. Visualization of collected data from the different location is done using statistical and user-friendly methods such as tables and line graphs. A website will to spread the pollution data collected by all the sensors, different colors will be allotted for different ranges of pollution meaningfully to give an idea about the level of pollution. Generation of reports are done per week on a regular interval and also real-time notifications are sent by appropriate authorities when the pollution level exceeds the normal range threshold value.

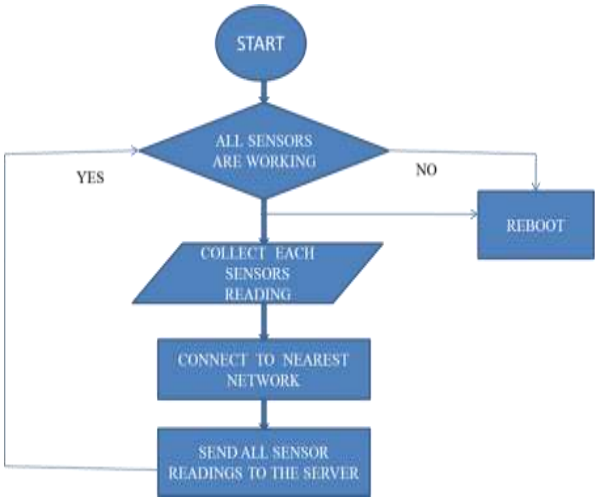

Fig-1: Flow Chart

3.1 Acquisition and storage of air quality data

Due to its influence, many cities across the country have experienced severely polluted weather for several days, and the gradual accumulation of population has aggravated this effect. The haze weather and heavily polluted air have brought many inconveniences to people's health and production and life, which have aroused widespread concern from the government and the public, and have become a hot spot for reports and discussions on major portal websites, Weibo, and news media, forecasting of brain health quality has become an urgent need. Generally, brain health quality numerical prediction is a combination of various forecasting methods and means, multi-disciplinary research on meteorology, physics, chemistry, geography, etc., to establish a brain health quality model, which is different for different scales such as various atmospheric pollutants.

3.2 Classify the data based on Bayesian algorithm

Classification is a form of analytical data that is used to extract the information and knowledge needed from the data to be analyzed, or to predict future information. In this paper, when validating the intelligent brain health quality prediction and real-time monitoring data processing based on big data, the Bayesian classification method is initially selected, mainly because it usually only has relatively few feature numbers for each project, and the training of the project. And classification is only a mathematical operation for feature probability, and the algorithm is simple and reliable. In the brain health quality monitoring system, the main components of the air are collected.

3.3 Create a prediction model

The front-end module for intelligent brain health quality index forecasting is the client that predicts brain health quality to users. At present, computers have spread to thousands of households in China, and 88% of households have personal computers, so the development is based on personal calculations. The computer's brain health quality forecasting platform can transmit predicted brain health quality information to many families, which is an aspect of front-end system development.

3.4 Monitor the brain health using Big data Map reduce

Based on the storage of data in the HDFS system, Map Reduce is used to accelerate the Bayesian classification decision process for the future. The weather is forecasted. According to the classification of brain health quality historical data, there are actually two operations. First, the brain health quality change law is obtained by analyzing the brain health quality historical data. First, the naive Bayes classification method is applied to classify the brain health quality change law. Both of these operations can be accelerated in parallel using the Map Reduce framework. The calculation of Map Reduce is divided into two processes: Map and Reduce. This process is a process of judging historical data to arrive at a brain health quality situation. The Reduce process collects the processing results of each task fragment, calculates and calculates the probability, and forms the final processing result. The prediction of brain health quality is the process of classifying and classifying a sample using the Bayesian method for the sample to be investigated.

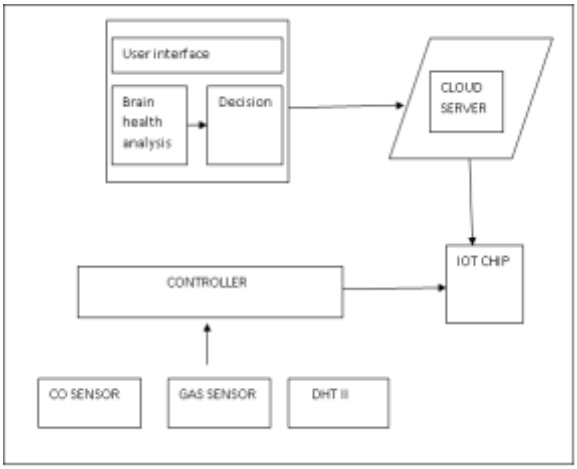

Fig-2: System Architecture

4. RESULTS

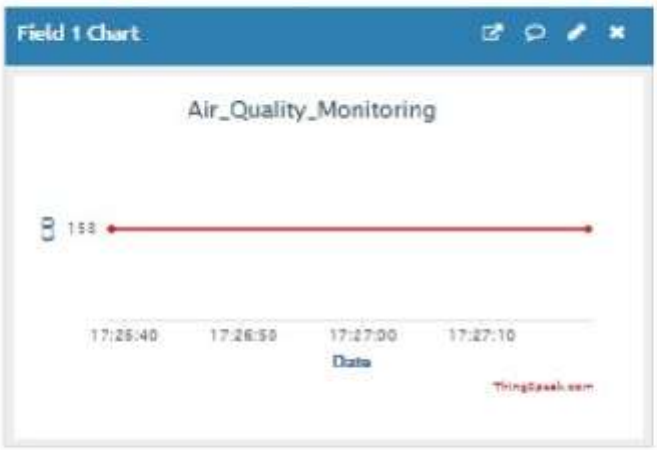

Fig-3: co monitoring

Fig-4: Gas Monitoring

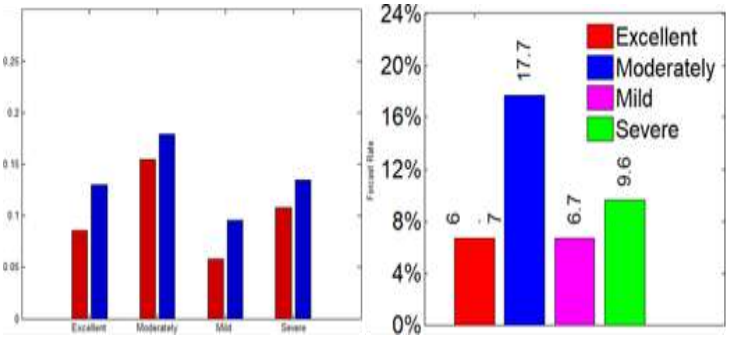

Fig-5: Three brain health quality detection model verification results based on Android platform.

5. CONCLUSIONS

The gas quality prediction model has certain feasibility from the experimental verification. The predictive monitoring model proposed in this paper combines big data, Internet of Things and smart devices, so that users can easily detect and predict brain health quality conditions, improve traditional single brain health quality testing methods, and make detection receipts more accurate. Next, the research work will be improved from the following aspects.

(1) At present, only the classic Bayesian classification method is tested. Next, other popular classification methods will be verified, and the comparison will be more appropriate. An intelligent decision-making method that analyses brain health quality index data is to improve the reliability of classification.
(2) The design of the model interface is rough. Next, the interface based on PC and Android will be optimized, and the iOS-based query interface will be developed to improve the system availability.
(3) Further optimize the storage of data, improve the speed of accessing data, and reduce the copying of data during the calculation process.

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