INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.542

Air Quality Prediction Using Machine Learning

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ABSTRACT: We forecast the air pleasant of India via the usage of machine gaining knowledge of to predict the air great index of a given area. Air pleasant index of India is a general measure used to point out the pollutant (so2, no2, rspm, spm. etc.) degrees over a period. We developed a model to predict the air high-quality index primarily based on historic facts of previous years and predicting over a specific upcoming 12 months multivariable regression problem. Examining and defending air excellent has come to be one of the most quintessential things to do for the authorities in many industrial and urban areas today. The meteorological and visitors factors, burning of fossil fuels, and industrial parameters play significant roles in air pollution.With this increasing air pollution, Weare in want of imposing models which will document records about concentrations of air pollutants(so2,no2,etc).

KEYWORDS: AQI, dataset, preprocessing, ML algorithm, pickle file

I. INTRODUCTION

As the largest growing industrial nation, India is producing record amount of pollutants specifically Co2, pm2.5 etc and other harmful aerial contaminants. Air quality of a particular state or a country is a measure on the effect of pollutants on the respected regions, as per the Indian air quality standard pollutants are indexed in terms of their scale, these air quality indexes indicates the levels of major pollutants on the atmosphere. In the developing countries like India, the rapid increase in population and economic upswing in cities have lead to environmental problems such as air pollution, water pollution, noise pollution and many more.

II. LITERATURE SURVEY

Pooja Bhalgat, Sejal Pitale, Sachin Bhoite Air Quality Prediction using Machine Learning Algorithms
There has been elevated public awareness about the equal in our country.Global warming, acid rains, amplify in the quantity of asthma sufferers are some of the long-term penalties of air pollution. Precised air satisfactory forecasting can reduce the effect of maximal air pollution on the human beings and biosphere as well. Hence, bettering air high-quality forecasting is one of the top objectives for the society.

Mrs.j.Gana jeslin, akshaya INDIAN AIR QUALITY PREDICTION AND ANALYSIS USING RuiJun YANG*, HaiLong ZHOU, DanFeng DING
According to hedonic rate theory, using classification algorithm of the machine learning which encompass SVM, Naive Bayesian and KNN, set up the internal mapping relationship between characteristic variables that encompass fees of housing and air quality. Air satisfactory in urban residential district is estimated by means of feature variables. Finally, experiments have performed on the data set of residential district In Tianhe, Guangzhou city, confirmed that the most accuracy..

Ms. Varsha Hable-Khandekar, Dr. Pravin Srinath
Air Pollution has emerge as major, serious hassle worldwide. Because of its close relation to human health, it has gained a lot of attention of many researchers. People are turning into more cautious about higher approaches of monitoring air high-quality statistics and has become vital to protect human fitness from serious fitness problems brought about by using air pollution.

III. EXISTING SYSTEM APPROACH

This paper presents an built-in mannequin the usage of Artificial Neural Networks and Kriging to predict the degree of air pollution at a number of places in Mumbai and Navi Mumbai using previous information on hand from

meteorological branch and Pollution Control Board. The proposed mannequin is implemented and tested the usage of MATLAB for ANN an R for Kriging and the outcomes are presented.This system has used the Linear regression Protocol for prediction of the pollution of subsequent day. The gadget helps to predict previous date pollution small print primarily based on basic parameters and inspecting pollution important points and forecast future pollution

Advantages:
- Improve air pollutions.
- Secure and efficient system

Disadvantage:
- It required internet connection must.

AlGORITHM :

• XGBoost

XGBoost is an optimized distributed gradient boosting library designed to be highly efficient, flexible and portable. It implements Machine Learning algorithms under the Gradient Boosting framework. It provides a parallel tree boosting to solve many data science problems in a fast and accurate way.

XGBoost dominates structured or tabular datasets classification and regression predictive modeling problems. The evidence is that it is the go-to algorithm for competition winners on the Kaggle competitive data science platform.

• Logistic regression

Logistic regression is used to obtain odds ratio in the presence of more than one explanatory variable. The procedure is quite similar to multiple linear regression, with the exception that the response variable is binomial. The result is the impact of each variable on the odds ratio of the observed event of interest.

Such a logistic model is called a log-odds model. Hence, in statistics, Logistic Regression is sometimes called the logistic model or logit model. ... The odds ratio (denoted OR) is simply calculated by the odds of being a case for one group divided by the odds of being a case for another group.

IV. PROPOSED SYSTEM APPROACH

Air excellent prediction carry non-verbal cues, which play an necessary role in interpersonal relations. Automatic predictions of great pair can be an vital component of natural human interfaces; it may also be used in behavioral science and in clinical practice. An automatic air quality predictions system wants to clear up the following troubles predictions and air first-rate index of dataset classification.
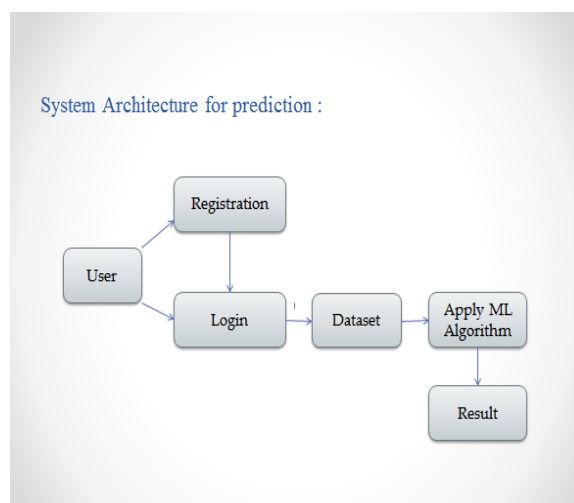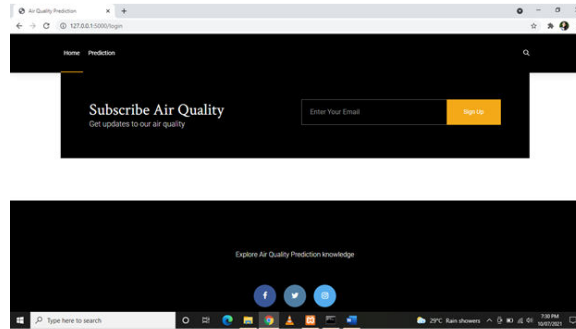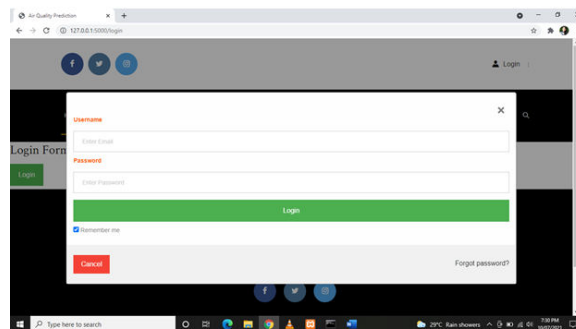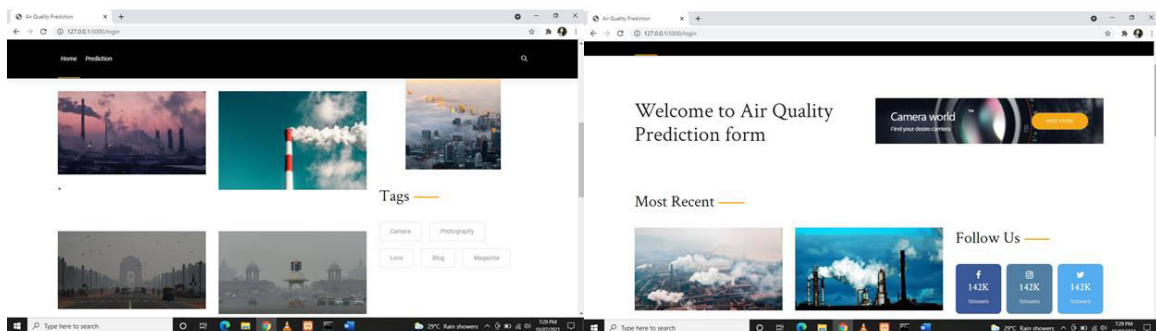
PROPOSED ARCHITECTURE

Figure:System Architecture

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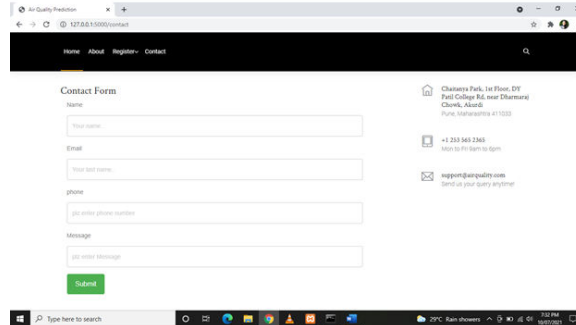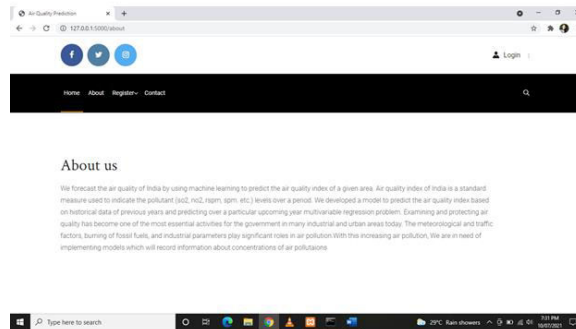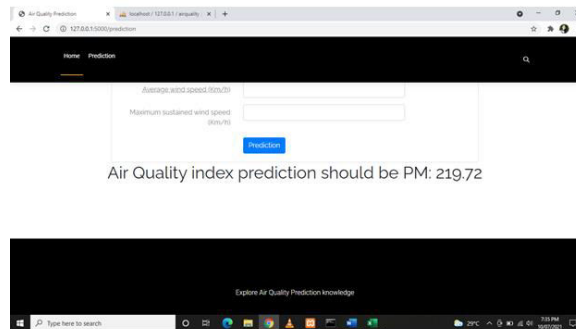

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V. CONCLUSION

Also for cities like Pune,Mumbai the place concentration of so2 is increasing, we can take measures from now to now not face problems later.We used AR model and prediction mannequin for predicting values. Features such as location_monitoring_station or station code were of no use as they have nothing to do with so2 predictions. This model is no longer capable to exhibit anticipated output as the statistics is no longer in sequence as per date column.The equal is the hassle for cities.If we predict for the whole state, it won't be helpful So we will be now calculating AQI and use classification..
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