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Prediction of risk analysis of natural disasters using regression model

Dr D.J Samatha Naidu*1, K. harsha vardhan*2,
*1, Principal, Annamacharya PG College of Computer Studies, Rajampet, Andhra Pradesh, India.
*2, Student MCA, Annamacharya PG College of Computer Studies, Rajampet, Andhra Pradesh, India.

Abstract: This document gives formatting guidelines for authors preparing papers for publication in the International Journal of All Research Education & Scientific Methods. The authors must follow the instructions given in the document for the papers to be published. The margins must be set as follows: Top = 0.7cm, Bottom = 0.7cm, Left = 0.65cm, Right = 0.65cm. Paper Title must be in Font Size 24, with Single Line Spacing. Authors Name must be in Font Size 12. Abstract should contain at least 200 words. Abstract explanation should be Times New Roman font, 09 Size, Bold, Single line spacing, text alignment should be justified. Author’s Profile must be in Font Size 8, Hanging 0.25 with single line spacing.
Keywords: About four key words or phrases in alphabetical order, separated by commas.

I. INTRODUCTION

Flood is caused by an overflow of water from a lake, river, or ocean that submerges neighbouring land. Every year, floods affect roughly 4.84 million people in India, 3.84million in bangladesh, and 3.28 million in China [1]. Other countries' cities are also prone to flooding. The Netherlands, Monaco, Bahrain, and other low-lying areas are at risk of floods. Australia's floods claimed 73 lives between 1997and 2008 [2]. Floods in the United States kill roughly 100people and cost $7.5 billion in damage yearly [3].
According to the World Resource Institute, floods would affect 147 million people by 2030, causing $174 billion to$712 billion in property damage [4].Bangladesh is one of the most vulnerable countries in South Asia to natural disasters, especially floods. According to the study [5], Bangladesh was hit by floods 78 times between 1971 and 2014, killing 41,783people. According to a study, the NARX structure of the Artificial Neural Network model [6] can predict floods 5hours in advance with 73.54% accuracy. The BPN model uses water level data from stations in Johor, Malaysia. The model's output was unsatisfactory, so an Extended Kalman Filter (EKF) was added to improve it.
The main goal of this research is to predict floods more accurately using Binary Logistic Regression. It is possible to classify the flood dataset using binary classification. Fitting the model to the training dataset reveals which model parameters should be used to predict unknown labels on other data. So far, classic ML methods like SVC and KNN have shown better accuracy.

II. RELATED WORK

Flooding can be caused by a mix of both natural processes, such as extreme weather upstream, and human changes to waterbodies and runoff. Flood control methods can be either of the *structural* type and of the *non-structural* type. Structural methods hold back floodwaters physically, while non-structural methods do not. To prevent or manage coastal flooding, coastal management practices have to handle natural processes like tides but also sea level rise due to climate change. Flood control is an important part of climate change adaptation and climate resilience.[58]

that is, it recommends that people get out of the area of a flood, rather than trying to cross it. At the most basic level, the best defense against floods is to seek higher ground for high-value uses while balancing the foreseeable risks with the benefits of occupying flood hazard zones.[59]:22–23 Critical community-safety facilities, such as hospitals, emergency-operations centers, and police, fire, and rescue services, should be built in areas least at risk of flooding. Structures, such as bridges, that must unavoidably be in flood hazard areas should be designed to withstand flooding. Areas most at risk for flooding could be put to valuable uses that could be abandoned temporarily as people retreat to safer flooding can be studied on three levels: on individual properties, small communities, and whole towns or cities

III. LITERATURE SURVEY

[1] proposed the system to improve real time flood forecasting using fuzzy inference system. The system uses Takagi Sugeno (T–S) fuzzy inference system. The proposed modified fuzzy inference systems provide an option of analyzing and computing cluster centers and membership functions for two different hydrological situations, i.e. low to medium flows (frequent events) as well as high to very high flows (rare events) generally encountered in real time flood forecasting. TSC-T–S fuzzy model provide reasonably accurate forecast with sufficient lead-time. The system lacks the proper prediction. RC Deo and Mehmat Sahin

IV. PROPOSED SYSTEM

The project addresses the problem of forecasting the river flow on the basis of rainfall and runoff data. The objective of the paper was twofold: one was to demonstrate the potential of the Random Forest Regression (RF) computing paradigm in modeling the rainfall-runoff process; and second was to evaluate the relative merits and demerits of this paradigm with reference to already popular SVM, ANN and GP modeling approaches. The study suggests that the RF model is able to capture the inherent nonlinearity in the rainfall-runoff process better than the other three, and is able to forecast flows satisfactorily up to 5 hours in advance. A very close fit was obtained between computed and observed flows up to 1 hour in advance for all models, but only the RF tends to preserve this performance at higher lead times. A comparative analysis of prediction accuracy of these models in different ranges of flow indicates that the RF is better than the ANN, SVM.

Advantages

High accuracy

High efficiency

IV. V.SYSTEM ARCHITECTURE

Modules

- Username
- Password
- Email
- Country
- Signup

User Module

In this module, there are n numbers of users are present. User should register before doing any operations. Once user registers, their details will be stored to the database. After registration successful, he has to login by using authorized user name and password.

V. VI.ALGORITHM

The suggested task would be a method for evaluating the dataset regarding rainfall in order to expect flash floods with greater accuracy using algorithms. This study shows a performance tuning point selection inheritable technique is shown in the table. The below steps demonstrate its suggested model offers an simple and systematic strategy for flood prediction:

1. Step 1: The rainfall dataset is pre processed.
2. Step 2: The rainfall dataset is randomly divided into testing and training.
3. Step 3: dataset was learned using the xgboost, Logistic Regression, Decision Tree, and KNN algorithms.
4. Step 4: The model is built with the highest accuracy using the xgboost and DT algorithm.
5. Step 5: Run the prediction model on the test data and validate the results.

Table: Performance analysis

Algorithm	Accuracy
XgBoost	0.9937888198757764
Logistic Regression	0.9875776397515528
Decision Tree	0.9937888198757764
KNN	0.9875776397515528

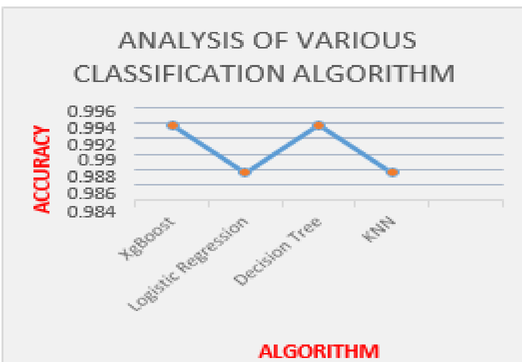
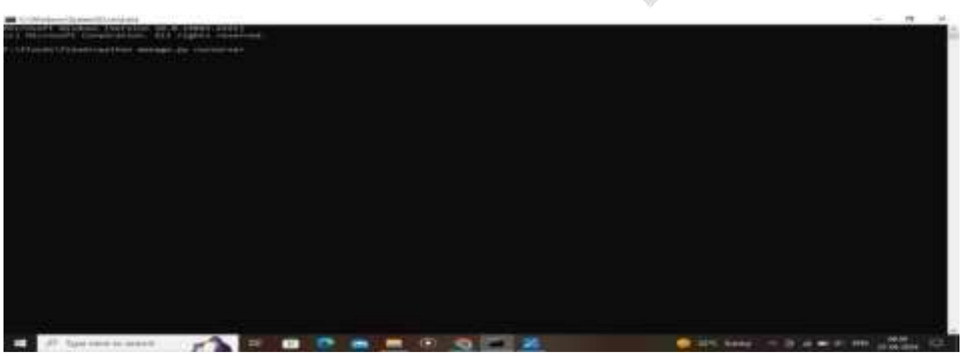


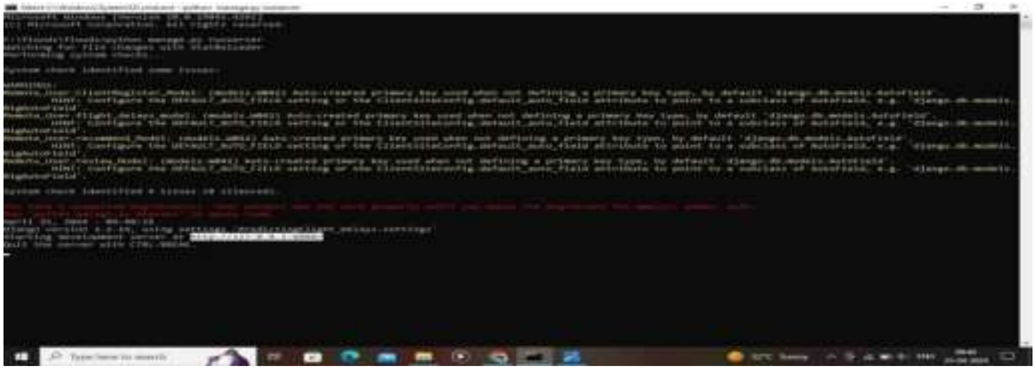
Fig. Analyzing variety categorization of algorithm forflood prediction

VI. VII.SCREENS

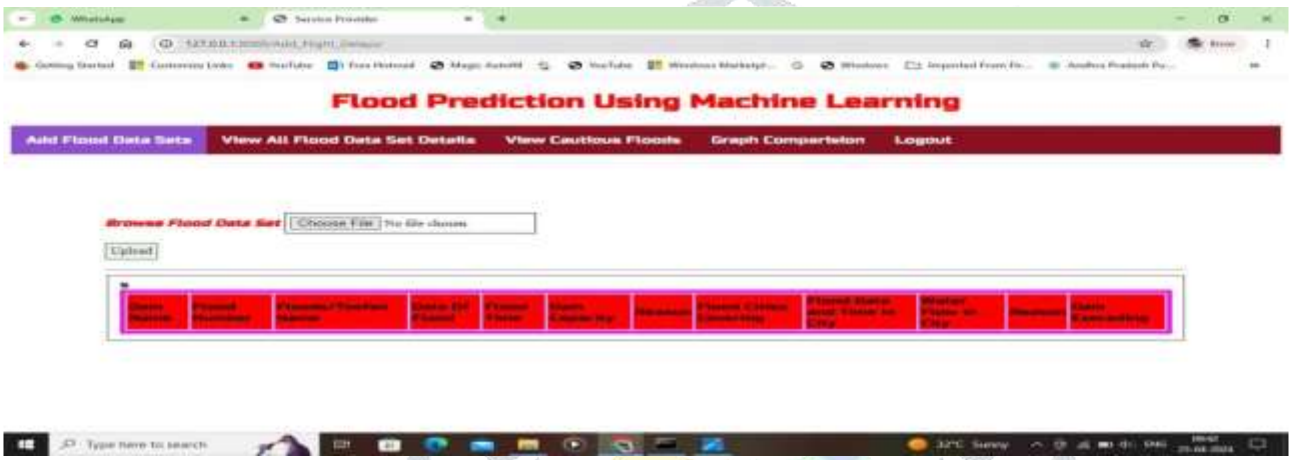
Screen1:open sql andwrite python manage.py runserver



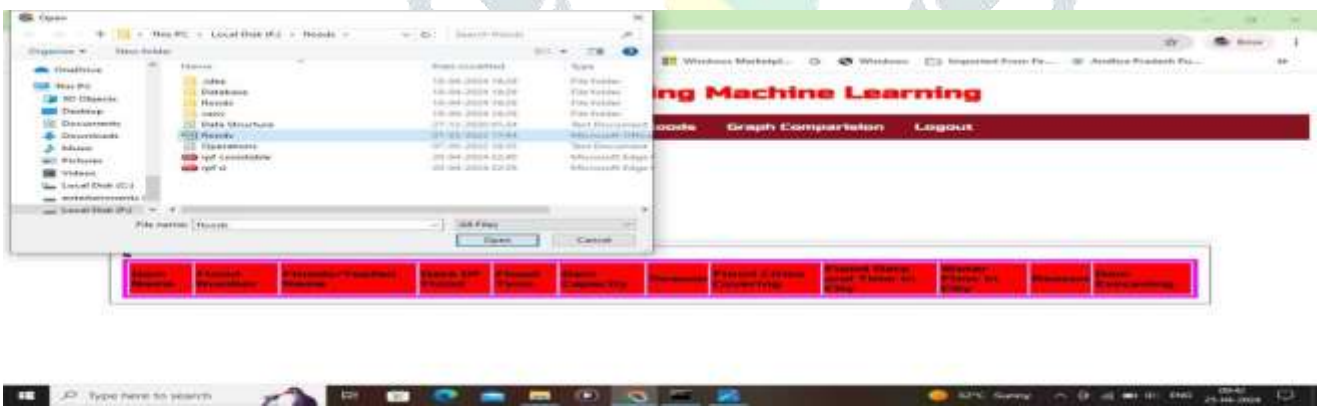
Screen2:click the ganarated link



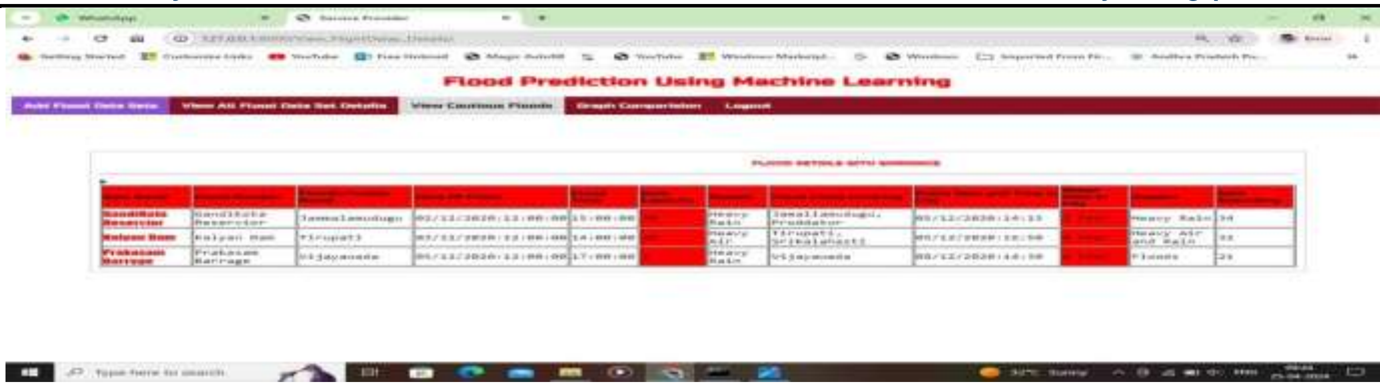
Screen3:display the frame work on the site



Screen4:to select your prepair dataset



Screen5:click upload button it display flooding areas in table and graphs also



I. VIII.CONCLUSION

As climate changes over the years and depending on other parameters, the thresholds for floods are changing. That's why the shorter timeline of data gives slightly better accuracy. Since these change over a long time period, in this research, the models gave higher accuracy with a shorter time range. Also, due to time constraint only the rainfall data along with flood occurrence was manageable. There are more factors related to flood like, river water level, temperature, humidity, other natural disasters etc. In the future, this research paper would attempt to develop the models further by adding the other factors and correlating them

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