

GC 287 Natural Disaster Prediction Using Machine Learning

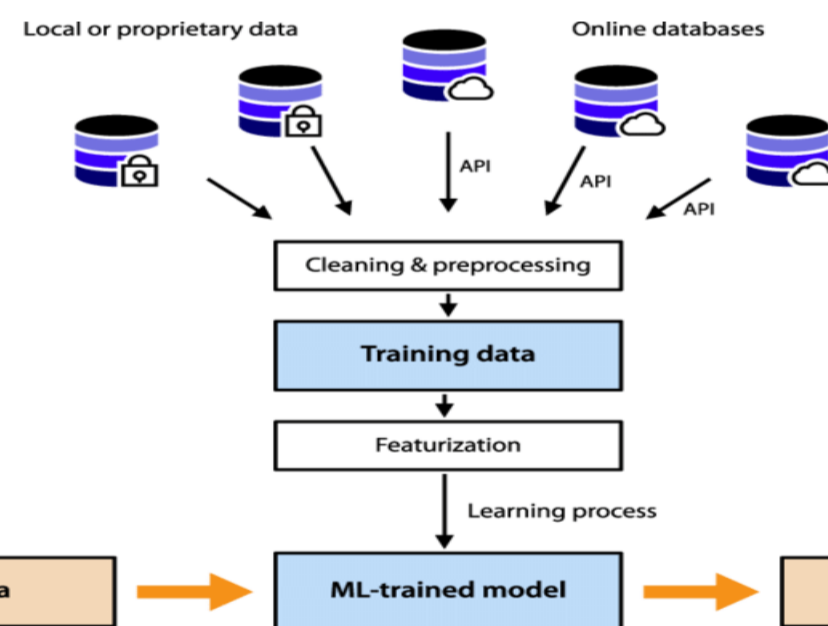
INTRODUCTION

Unpredictable natural processes cause natural disasters. Natural catastrophes cause death, property destruction, and economic losses. From 1900 to 2018, the WHO estimates 14 million deaths from all disasters. One way to reduce disasters is to reduce natural disaster risks. Disaster risk reduction reduces disaster damages and victims. According to studies, disaster management aims to minimize victims, save victims quickly, evacuate people to safe places, rebuild damages immediately, and offer first aid instantly. Machine learning is today's tech. According to studies, it's crucial to uncover huge hidden values in complicated, diversified, massive datasets. Using historical data can reveal hidden patterns and information. We can make predictions based on what was observed in the past, and perhaps, prevent a potential disaster in the future. Our project aims to predict occurrence of the magnitude of the Earthquakes in a particular location using Machine Learning.

MOTIVATION

There is a lot that machine learning can do to aid in disaster relief. Predicting when and where a disaster will strike could save thousands of lives and reduce the damage to property and utilities.

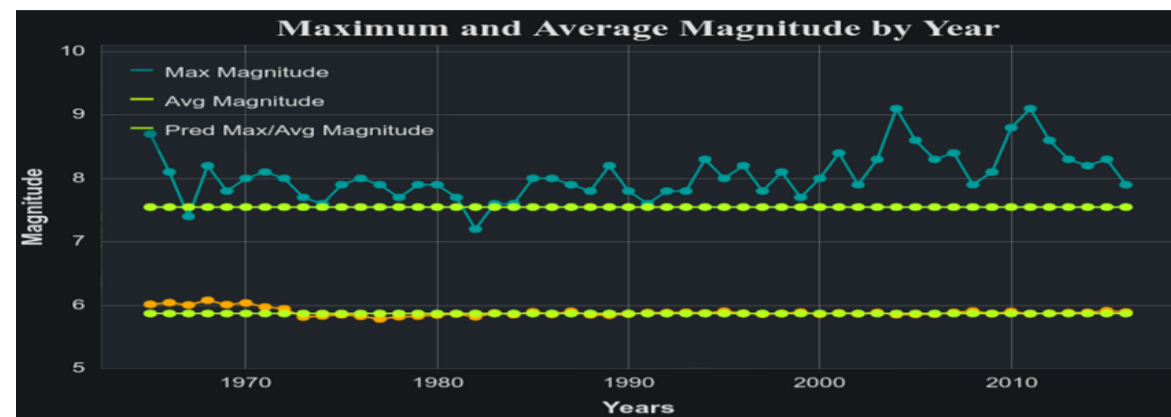
METHODOLOGY



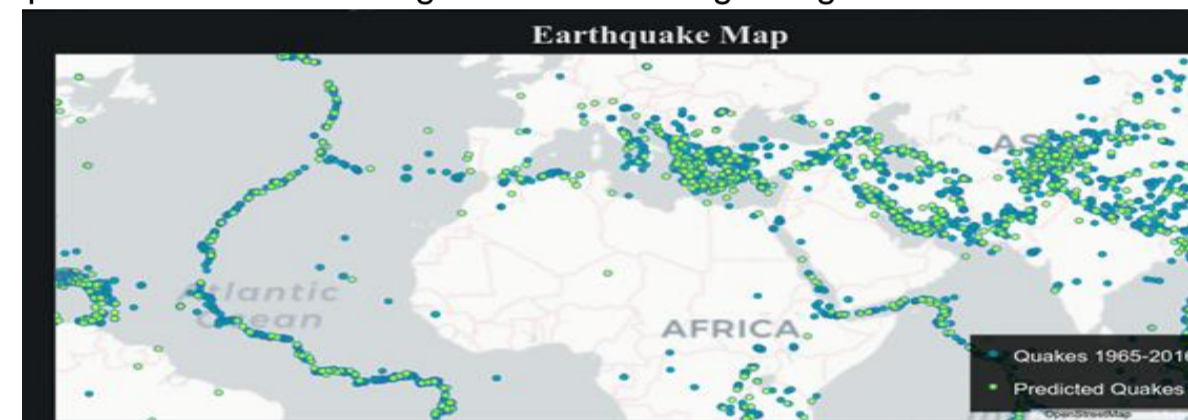
DATASET

We used Geospatial data of from year 1965-2016 that consists of magnitude, latitude, longitude, date when the earthquakes occurred.

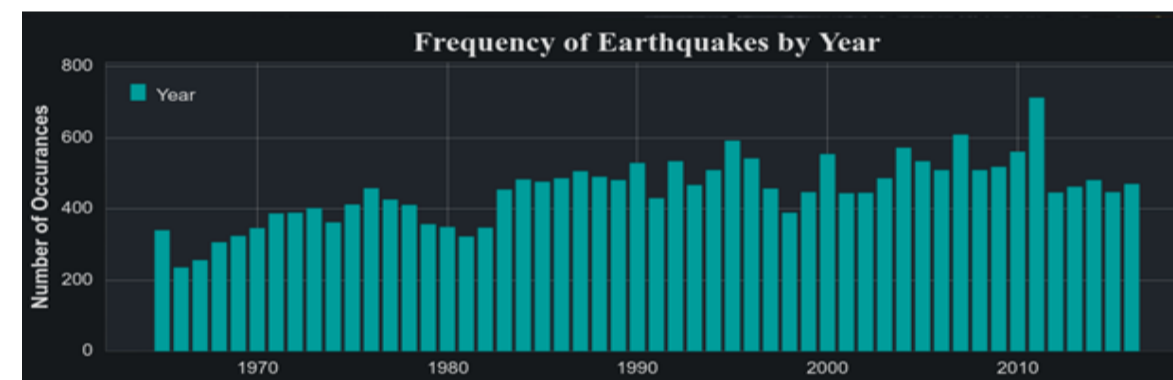
RESULTS



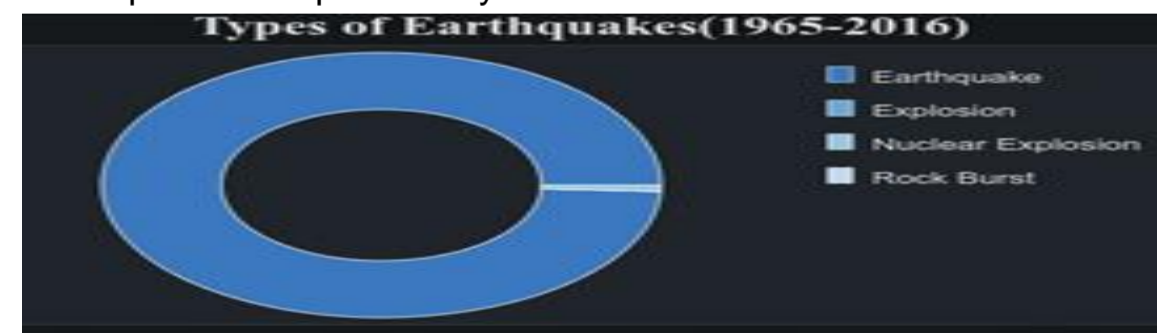
Magnitude Plot: This plot depicts about the maximum magnitude and average magnitude of the earthquakes occurred by year and also the predicted maximum magnitude and average magnitude.



Map Plot: From this plot user can infer with what magnitude earthquakes occurred at a particular location around the globe and also the predicted quake magnitude in the future i.e year.



Bar Plot: This plot describes about the number of occurrences of earthquakes in a particular year.



Dough Nut Plot: This shows about the percentage of the type of the earthquakes occurred.

Model	Accuracy
Linear Regression	87.2%
Random Forest Regression	90.1%
Logistic Regression	75.4%

Trained the data with 3 models and Random forest regressor got best accuracy to predict.

CONCLUSIONS

1. The goals of this project can be broken down into four categories: earthquake prediction, disaster frequency, earthquake magnitude, and earthquake type. Through this data analysis and visualization, we were able to spot the trend and find a solution to the issue at hand. Through either foreseeing the occurrence or employing it for early detection.
2. 90.1% accuracy is obtained by using Random Forest regression algorithm.

FUTURE WORK

Our project tries to figure out how big an earthquake will be in a certain place in a certain year. As part of our future work, we plan to make a prediction about when it will happen at a particular time and date.

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