Is it possible to predict earthquakes?

# **Michael Gonzalez DSC 680 Fall2020 https://micgonzalez.github.io/**

# Which Domain?

This project will look at the global recorded data of earthquakes of magnitude of 5.0 and greater from the years of 1965 to 2016. This dataset falls into the natural science domain. I also could think that this would be in the local government domain for earthquake prone areas. In this last project of the course, I am hoping to use this earthquake dataset to see if it is possible to predict future earthquakes. I will add the 10 references at the end of this proposal.

# Which Data?

The selected dataset comes from Kaggle with the focus of having recorded earthquake data of 5.0 and greater. The dataset has twenty-one attributes that are based on useful information of the different aspects of these earthquakes. The selected dataset has data starting from January 2nd, 1965 to December 30th, 2016. This dataset has data points that include date, time, latitude, longitude, type, depth, depth error, depth seismic stations, magnitude, magnitude type, magnitude error, magnitude seismic station, azimuthal gap, horizontal distance, horizontal error, root mean square, id, source, location source, magnitude source, and status. These data points will help in giving insights on seeing the possible trends that will allow me to predict future earthquakes. Below is a link to the dataset:

<https://www.kaggle.com/usgs/earthquake-database/>

# Research Questions? Benefits? Why analyze these data?

The research questions are related to the title of this proposal. Will it be possible to know when future earthquakes will appear before they start? I wonder if predicting earthquakes could be done in a similar manner as people predict the weather? I understand scientists can detect earthquakes and warn people a few seconds before feeling an earthquake. The timeframe from this current method is very limited. From being able to predict earthquakes, it would allow people more time to prepare and brace the upcoming earthquake. Knowing when the earthquake will appear, will likely lower damages to properties and injuries. It will also allow people and local governments to financially prepare for earthquakes.

# What Method?

I am planning to use two models that help me with dealing this unique problem of predicting earthquakes. The advantage of using two models, will give me confidence that the predictions will be successful. As this will mean of a better chance of one or both models be successful by using different classifiers. The models used for this method will be logistic regression and random forest. Since this is a new domain for me. I feel that using different models will less likely have bias in the resulting prediction and it might lead to a different path. This is something that could be proven in this section of the process.

# Potential Issues?

I need to disclose that I have limited knowledge in this domain. I know when I perform an exploratory data analysis, I will need to do so some research on the terminology and the meaning of the data. This will take a good portion of my time in the beginning of this project. When dealing with a wide range of years, it is easy to lose track of the prevalent task at hand. One other issue will be dealing with some of the attributes of the selected dataset. For example, I am not sure if using the depth seismic station, magnitude seismic station, azimuthal gap, horizontal distance, and status values could translate to any meaningful results. I see that some of the attributes might not do well when it comes to developing a few visualizations and I not sure what do in this situation. The solution for this, could be trial and error and hope for the best. I am using this solution for any other unforeseen issues that will pop up during this last project.

# Concluding Remarks

The dataset has twenty-one attributes that are based on useful information on the recorded data of past earthquakes in the world. This dataset has data points that includes the magnitude values, time of recorded earthquakes, and the root mean squared value of the combine measuring attributes. These data points might help in leading me to different paths that could answer my research questions. Earthquakes affects many people around the world, and I have not seen much information in this domain. Growing up in California, I was always been accustomed to being prepared for an earthquake. It is a problem that is always in the back of your mind, when living in California. By finding a way to predict future earthquakes, it might give people valuable information that could result in minimizing injures and damages to property.

**10 References:**

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