Research Project Relevance

Classification – kmeans clustering for classification of different seismic events

Unsupervised approach

t-SNE visualization

optimal # of clusters is 4

Our project uses unsupervised clustering to categorize seismic signals around a volcanic eruption. By categorizing seismic activity, we can determine different phases in the eruption process. Information about these categories can help us predict future eruptions based on those tremors. We use an unsupervised approach because we do not necessarily know which seismic signals correlate to what volcanic activity when we input the data. By letting the machine find its own groups, we learn how many and what distinct seismic phases exist in the specific eruption. We are applying k-means clustering to multiple different volcanoes of different types to see what kind of groups we will get. We expect to see different categories of seismic activity that span different lengths of time depending on the specific volcano and its type of activity. When we continue to use deep learning, specifically deep embedded clustering, we hope to see more specific stages of volcanic eruption.