Analysing Seismic data of Palghar using ML

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Dataset:-

Datasets are from National Geophysical Research Institute(NGRI) and National Centre for Seismology(NCS).

Idea:-

A lot of earthquakes go unreported because of background noise and non-earthquake signals in continuous seismic data. Classically characteristics function methods such as STA/LTA are utilised to identify but are highly sensitive to background noise and susceptible to high error rates. Hence each point is manually checked. In order to speed us ML can be used.

Research method:-

Literature review → Dataset(collection and labelling) → Preprocessing → Model training (Learning, Optimization, Model selection, cross validation) → Model evaluation(metrics and testing) → Implementation

Algorithms:-

1. KNN(K-NEAREST NEIGHBOUR)
2. SVM(SUPPORT VECTOR MACHINE)
3. NEURAL NETWORKS (RNN and CNN)

Motivation:-

A complete catalog of the earthquakes would help better understand the reasons and even the nature of the crust in the concerned region.

What to do by midway:-

We want to implement all the techniques used in our references and use these as a baseline and try to improve the accuracy.(especially in challenging situations).

Expectations:-

1. Achieve an higher accuracy.
2. Minimizing false negatives (missing events) and false positives (misidentifying noise as earthquake signals) is the main objective.
3. Detecting more earthquakes with low SNR.

References:-

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