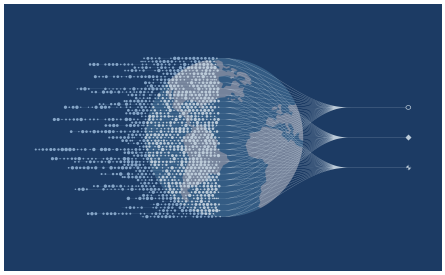

ID: **P2.2-729** Type: **E-poster**

Earthquakes from Anthropogenic Events in Madagascar

The earthquake catalog is a crucial component in seismic hazard assessment. However, it can be affected by non-natural earthquake sources. Hence, this study aims to differentiate between natural and non-natural earthquakes through machine learning techniques. We propose a convolutional neural network based on spectrograms for waveform classification, applied to the contexte of Madagascar. Our approach consists of three main steps:(1) generating the time-frequency representation of ground motion (spectrogram), (2) training and validating the model, and (3) testing and making predictions. We use a standard loss function and accuracy measure to evaluate the predictions. Our analysis is conducted in two steps. First, we adopt a supervised approach for 6051 known events in the central part of Madagascar. Then, we use the training outcome and perform prediction for non-categorized events. The results demonstrate that our model effectively distinguishes earthquakes from mining-related events. In the supervised learning phase, 97.48% were correctly labeled, while 2.52% received incorrect labels. These pre-trained data are subsequently used to predict unlabeled events. Our findings indicate that the model successfully learns the distinguishing features of the different classes, even for data coming from different parts of Madagascar. To further evaluate our methodology, we also compared the results with other deep learning techniques.

E-mail

hobyraza@gmail.com

In-person or online preference

Primary author: RAZAFINDRAKOTO, Hoby N.T. (Institute and Observatory of Geophysics of Antananarivo (IOGA))

Co-author: RAKOTOARISOA, A. Tahina (Institute and Observatory of Geophysics of Antananarivo (IOGA))

Presenter: RAZAFINDRAKOTO, Hoby N.T. (Institute and Observatory of Geophysics of Antananarivo (IOGA))

Session Classification: P2.2 Seismoacoustic Sources in Theory and Practice

Track Classification: Theme 2. Monitoring events and Nuclear Test Sites: T2.2 Seismoacoustic Sources in Theory and Practice