

# S52A-05 - Towards Systematic Classification of Seismic Signals with Deep Neural Networks

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Friday, 13 December 2019



11:20 - 11:35



Moscone South - 158, Upper Mezz.

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## Swirl Topics

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Data & Rising Technologies - SWIRL

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## Abstract

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As the amount of seismic data increases rapidly, the number of studies providing event catalogs also increases. The seismology community has now access to substantial labeled data with different classes of events: earthquakes (local or distant), tremors, low-frequency earthquakes, noise, etc. We gather a large amount of labeled seismograms to train a universal classifier of seismic signals. The relevant features are extracted from the spectrograms with a state-of-the-art deep neural network. We analyze events of many types, recorded by multiple stations distributed all over the globe. We aim at making a classifier that is robust to differences in instrumental response and to differences in geological context. Our classifier could be apply to any new dataset to detect and classify seismic activity with no requirement for prior knowledge of the region or for any particular preprocessing of the data (i.e. as an expert analyst could visually do). Thus, the contribution of this study is two-fold: 1) providing a tool capable of giving a comprehensive and fast description of an unknown dataset and 2) determining which features are keys to classify seismic events.

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