

Deep Learning for Earthquake Monitoring

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Seismic networks are continuously recording seismic data around the world. These data contain rich information about earthquake processes, but traditional auto-processing algorithms can not fully extract this information. Fortunately, the existence of large manually labeled data sets provides us an excellent opportunity for developing deep-learning algorithms for earthquake monitoring. Deep learning is an effective, data-driven way to build a nonlinear map from a high-dimensional input distribution to a target distribution of interest. In this work, we present some of our recent efforts in developing deep-learning models to denoise, detect, pick, cluster, and associated earthquakes. These new algorithms and rapidly evolving deep-learning techniques can improve earthquake catalog generation and thus provide a much clearer and more detailed picture of earthquake processes.