

Using deep learning with high-performance computing to monitor seismic events is an innovative approach that can enhance the ability to detect, classify & analyze seismic activity. Semi-supervised or unsupervised learning techniques can alleviate this challenge. –Model generalization: Seismic patterns vary across regions. Transfer learning and domain adaptation are critical –Feature extraction: Deep learning models can extract complex features from raw seismic waveforms, distinguishing between natural and human-induced events. –Resource Demand: Training large deep learning models on high-performance computing can be computationally expensive. Parallel Computing: High-performance computing enables parallel processing of seismic datasets, which speeds up the training and inference phases of deep learning models. Big data processing: Coming from international data centers where seismic networks generate terabytes of data per day, high-performance computing systems provide the computational power to efficiently train and deploy deep learning models on these large data sets. –Data classification: Annotating large seismic data sets for supervised learning is a lot of work.