

Improving Earthquake Forecasts with Machine Learning

The central challenge in earthquake science is to accurately estimate future seismic hazard. Many hypotheses and models of future earthquake potential have been proposed and are now being evaluated by the global Collaboratory for the Study of Earthquake Predictability (CSEP, www.cseptesting.org). CSEP's goals are to provide independent evaluations of earthquake forecasting methods and to help government agencies assess the utility of earthquake forecasts for risk mitigation. Over 450 forecast models are now under testing within CSEP. This project aims to identify promising statistical learning methods within CSEP that can improve forecasts by merging multiple models optimally. On a theoretical level, we are interested in what could go wrong when applying standard machine-learning techniques to this problem. In practice, this project offers the opportunity to prototype promising strategies and apply them to forecast models and data in California.