Brian Kelly

Seismologist, Geologist, Computational Modeler, Educator | bkelly2014@ufl.edu | LinkedIn

Work Experience

Graduate Research & Teaching Assistant **Aug. 2019 – Aug. 2024**
University of Florida *Gainesville, FL*

- Processed seismic waveforms and measured travel path-dependent wave attenuation data from recordings of aftershocks of the 2015 M 8.3 Illapel, Chile earthquake
- Created an inverse model to generate a 3D wave attenuation tomography of the Illapel region using least-squares regression with the attenuation data, parallelized on supercomputing resources
- Produced publication-quality graphs, maps and figures and interpreted results
- Prepared lesson plans, led lectures, facilitated a productive, positive classroom environment, and graded assignments for a variety of courses in the geology curriculum

USGS Pathways Intern **May – Aug. 2022 & May – Aug. 2023**
Geologic Hazards Science Center, USGS *Golden, CO*

- Developed algorithms and wrote scripts to assess existing models of the earthquake source effect known as directivity for accuracy
- Generated database of synthetic earthquakes with spatial directivity patterns dependent on earthquake characteristics
- Built and trained feed-forward neural networks on synthetic directivity data to capture the spatial directivity effect and make predictions on real faults
- Implemented these neural networks in the research version of the USGS National Seismic Hazard Model (NSHM) to assess the impact of inclusion of directivity in ground motion models

Education

Ph.D., Geology **Aug. 2024**
University of Florida *Gainesville, FL*

- Dissertation: *Investigating Rupture Properties of Large Earthquakes for Seismic Hazard Mitigation*

B.S., Geology **Aug. 2018**
University of Florida *Gainesville, FL*

Technical Skills

Programming Languages: Python, Bash

Libraries: Tensorflow/Keras, scikit-learn, numpy, pandas, scipy, matplotlib, mpi4py, pyGMT, OpenQuake, shakelib

Software: Git, VSCode, SLURM, Seismic Analysis Code, Generic Mapping Tools, Adobe Illustrator