Bing He

Marine Geophysics | Machine Learning | Numerical Simulation | Seafloor Geodesy | Data Science & Analytics
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EDUCATION

Graduate School of Oceanography, University of Rhode Island, Narragansett, RI
Ph.D. Candidate in Marine Geology and Geophysics Expected August 2022

- **Honors:** 2 GSO Alumni Awards, McMaster Award
- **Dissertation:** Detecting slow slip events using machine learning method from the seafloor pressure data

The Chinese University of Hong Kong, Hong Kong, China
Master's Degree in Earth and Atmospheric Science June 2017

- **Honors:** Best Teaching Assistant Award, Outreach Award

Jilin University, Jilin, China
Bachelor's Degree of Engineering in Applied Geophysics June 2015

- **Honors:** 2nd Class Scholarship, Excellent Student Award

PROFESSIONAL EXPERIENCE

- **Designed a machine learning algorithm to automatically detect special tectonic events in long time series.**
  - Designed event detector incorporating convolutional and recurrent neural networks using Keras and TensorFlow.
  - Algorithm lowers the costs to detect such events compared to the conventional method.
  - Published first author paper in *Geophysical Research Letter and* preparing second paper for *Science Advance*.
- **Developed a machine learning based model to automatically separate earthquake and ambient noise signals collaborating with seismologists at Harvard University.**
  - Separated two complex signals using Encoder-Decoder network and regression method in PyTorch.
  - The developed method can be used in real-time earthquake data analysis. A co-authored paper is in preparation.
- **Processed and analyzed immense seafloor pressure and deep currents data using principal components analysis method collaborating with physical oceanographers.**
  - Removed tides and instrumental drift from the interpolated pressure data and investigated the relationship between seafloor pressure and deep currents data. Co-authored paper in *Journal of Geophysical Research.*
- **Designed a transparent workflow to detect tremors (microseism) from 2 terabits ocean bottom seismic data using cross-correlation method and Hierarchical cluster method.**
- **Built a 3D subduction zone model using CUBIT, simulated earthquake process using PYLITH.**
  - Reproduced the 2012 Nicoya earthquake process using numerical simulation method, simulated the ground motion from different nucleation sources, and analyzed the potential seismic hazards in Costa Rica coastal region.
  - Published 2 co-authored papers in *Journal of Geophysical Research* and *Earth and Planetary Science Letters.*

RELEVANT EXPERIENCE

- *Grant Writing:* Drafted two successful NSF proposals assisting principal investigators – funding awarded.
- *Communications:* Gave 10+ oral and poster presentations in global Geoscience conferences, including *American Geophysical Union*, *Ocean Science, 2nd Machine Learning in Solid Earth Geoscience*, *Community Seafloor Geodesy.*
- *Training:* Served as mentor for first-year Ph.D. students and taught them basic programming skills.
- Served as a curator assistant in Rock & Core Lab for two years and conducted several tours for kids and adults.
- *Computer & Technology:*
  - Visualize and analyze complex data using Python, MATLAB, GMT, and Google Earth.
  - Use High-Performance Computers for computing machine learning models and numerical simulations.
  - Conduct analysis for big data including geospatial data, global ocean model data, seismic and geodetic data

COMPUTER SKILLS

Python (Pandas, Scikit-learn, Scipy, Matplotlib, Keras, TensorFlow, PyTorch), MATLAB, R, Shell, SQL, C++, GMT, CUBIT, PYLITH, ParaView, Google Earth, Adobe Illustrator, Photoshop, LaTeX, Microsoft Office, Linux, Windows.