Mahdi Hamidbeygi

Toronto, ON, Canada

☎ +1 403-993-6164 | ✉ mahdihamidbeygi@gmail.com | 🐙 mahdihamidbeygi | 🔗 mahdihamidbeygi

Summary

Data Scientist and Geophysical Engineer with expertise in **signal processing, machine learning, and geophysical data analysis**. Experienced in developing **high-performance algorithms** for seismic interpretation, navigation systems, and geophysical modelling. Strong programming skills in **Python, Bayesian inference, and Monte Carlo methods**. Passionate about leveraging data-driven solutions for geophysical exploration, scientific computing, and decision-making in high-impact industries.

Experience

Data Scientist, Novamera Inc. Oakville, ON   Jul 2023 - Mar 2025

- Designed and implemented **real-time navigation and data processing algorithms**, improving system accuracy in precision mining.
- Developed **signal processing stacks** that enhanced seismic data quality by 20%, enabling more precise subsurface imaging.
- Developed **object-oriented Python** packages to support **quality control** and **processing workflows**, improving overall efficiency and speed by 75%.
- Developed **Human-Machine Interfaces** for operational control, improving equipment efficiency by **50%**.
- Engineered **statistical models for seismic signal denoising**, optimizing feature extraction for geophysical applications.
- Developed a **CNN quality control model**, increasing the accuracy up to 90%.
- Collaborated with geophysicists to refine data-driven insights, supporting enhanced seismic interpretation and decision-making.

Researcher & Developer, University of Calgary Calgary, AB   Jan 2021 - Dec 2022

- Developed a **Bayesian probabilistic method** for seismic source inversion, increasing accuracy in moment tensor estimations.
- Published and integrated Python code into **open-source geophysical software** (**BEAT**), contributing to industry adoption.
- Applied **Sequential Monte Carlo (SMC)** methods to reduce uncertainty in seismic model parameters.
- Designed a **non-Toeplitz covariance matrix approach** to enhance noise handling in real-world seismic datasets.
- Created and presented technical reports for industry sponsors and academic conferences.

Researcher, Dalhousie University Halifax, NS   Feb 2020 - Aug 2020

- Remodeled a fully convolutional neural network (**FCN**), improving earthquake location estimation.
- Reviewed and tested various **machine learning algorithms** for seismic phase picking and event classification.
- Developed a modified **graph neural network** to improve seismic phase arrival detection.

Developer, Dejpad adak , Tehran   Apr 2018 - Jan 2020

- Implemented rich user experiences by creating **30+ new features** utilizing **HTML, JavaScript, and CSS**.
- Developed and maintained **30+ REST APIs**, documenting them using **OpenAPI specifications**.
- Collaborated with **2 engineering teams** on domain, design, and code testing for **12+ projects**.
- Participated in **weekly code reviews** with **4 senior developers**.
- Wrote **47 automated tests** to raise code quality as part of the development process.

Reports & Publications

Bayesian CMT inversion using multiple seismic data sets, University of Alberta and University of Calgary Microseismic Industry Consortium, Annual Research Report   Nov 2022

Bayesian estimation of nonlinear centroid moment tensors using multiple seismic data sets, Geophysical Journal International   Oct 2022

Moment tensor waveform inversions for several induced events in the Fort St. John area, University of Alberta and University of Calgary Microseismic Industry Consortium, Annual Research Report   Nov 2021

Bayesian joint polarity and waveform inversion for induced earthquakes, University of Alberta and University of Calgary Microseismic Industry Consortium, Annual Research Report   Nov 2021

Seismic Hazard Assessment for the southwest of Khazar Sea, Marine Science and Technology   Jul 2019

Integrating Resistivity and Microgravity Data in Detection of Underground Canals-Amir Abad-Tehran, Mining Science   Jul 2014

Certifications

CS50's Introduction to Computer Science , HarvardX CS50x   2023
JavaScript Essential Training , Linkedin   2023
Kubernetes: Your First Project Linkedin   2023
Django Essential Training , Linkedin   2022
Azure Fundamentals , Microsoft   2022
Python programmer , **Career** track, Data camp   2022
Data scientist , **Career** track, Data camp   2022
Statistical Simulation in Python , Data camp   2022
Introduction to Deep Learning in Python , Data camp   2022
Learning SQL Programming , Linkedin   2022

Education

Certified Data Scientist Associate Datacamp   Sept 2022 - Nov 2022

MSc in Geophysics University of Calgary Calgary, AB   Jan 2021 - Dec 2022

- **Thesis:** Nonlinear Bayesian estimation of centroid moment tensors using multiple seismic data sets in the Kiskatinaw seismic monitoring and mitigation area.
- **Courses:** Data Mining & Machine Learning, Inverse Theory & Application I, Global Seismology, Introduction to Passive Seismic Monitoring.

MSc in Earthquake Seismology University of Tehran Tehran, Iran   Sept 2015 - Apr 2018

- **Thesis:** Extracting Love and Rayleigh wave empirical Green's functions using seismic ambient noise in northwest Iran.
- **Courses:** Earthquake Seismology, Exploration Seismology, Engineering Seismology, Gravimetry, Geoelectrical Methods, Seismotectonics, Geomagnetism.

BSc in Mining Engineering University of Tehran Tehran, Iran   Sept 2010 - Apr 2014

References available upon request.