

Hassan Khaniani

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A. Profile summary

I earned my B.Sc. (2003) and M.Sc. (2006) in Petroleum Exploration Engineering, and a Ph.D. (2015) in Exploration Geophysics from the University of Calgary, Canada. My postdoctoral and industrial experience focused on High-Performance Computing (HPC) applications in seismic imaging and inversion. I joined the New Mexico Institute of Mining and Technology (NMT) in 2020 as a Research Scientist and currently serve as an Assistant Professor with a joint appointment between the Petroleum Recovery Research Center (PRRC) and the Department of Mineral Engineering. My research at PRRC focuses on subsurface modeling, seismic imaging, and reservoir characterization, while my work in the Department of Mineral Engineering addresses mine safety, evacuation planning, and environmental monitoring in underground mines under hazardous conditions such as fire, smoke, and gas propagation. I lead the software development team for an underground mine rescue project funded by the National Institute for Occupational Safety and Health (NIOSH–CDC). In addition to research, I teach several graduate and undergraduate courses at NMT, including Machine Learning with Applications in Geoscience and Engineering, Geostatistics, Surface Mining, Mine Ventilation, Software Programming, and Occupational Health and Safety.

Institution and location	Degree	Date	Field of study
University of Calgary-Canada	Ph.D.	2009/09-2015/02	Geophysics-Exploration seismology
University of Calgary-Canada	M.Eng.	2004/05-2006/05	Petroleum Engineering (major in Exploration)
Petroleum University of Technology- Iran	B.Sc.	1999/09-2003/09	Petroleum Engineering (major in Exploration)

Employment positions

Position	Location	Dates
Assistant Professor	New Mexico Institute of Mining and Technology (NMT) <i>Joint Appointment: Petroleum Recovery Research Center (PRRC) and Department of Mineral Engineering.</i>	2025/05-Current
Research Scientist	New Mexico Institute of Mining and Technology (NMT) <i>Department of Petroleum Recovery Research Center (PRRC)</i>	2020/08-2025/05
Researcher	Ashaw Energy - Calgary, Canada.	2020/02-2020/08
Postdoctoral fellow	University of Calgary and Absolute Imaging Inc- Canada	2020/02-2020/08
R&D geophysicist	Absolute Imaging Inc- Calgary, Canada	2019/02-2020/02
Postdoctoral fellow	University of Calgary, CREWES consortium- Calgary, Alberta	2017/02-2018/01
Research consultant	Suncor Energy, Unconventional resources, Calgary, Alberta	2014/03-2015/03
Research intern geophysicist	Nexen Energy, Calgary, Alberta	2012/05-2014/03

Graduate Student Assistant	Consortium for Research in Elastic Wave Exploration Seismology (CREWES), University of Calgary	2009/09-2015/02
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SELECTED PUBLICATIONS

Google scholar: <https://scholar.google.com/citations?user=QgSdVkgAAAAJ&hl=en&authuser=1>

Personal academic website: [Automation Lab](#)

1. Androulakis V., Kingman S., **Khaniani H.**, Hassanalian M., Shao S., Roghanchi P., 2025, *Intelligent Self-Evacuation Path Planning for Fire Emergencies in Underground Coal Mines*, **Tunnelling and Underground Space Technology**, Vol. 162, Article 106623, Elsevier. <https://doi.org/10.1016/j.tust.2025.106623>
2. Owusu-Ansah R., **Khaniani H.**, Androulakis V., Hassanalian M., Roghanchi P., 2025, *Optimizing Fire Emergency Evacuation Routes in Underground Coal Mines: An Application to Simulation Rig Data*, in **Tunnelling into a Sustainable Future – Methods and Technologies**, pp. 687–694, CRC Press.
3. Lotero S., Androulakis V., **Khaniani H.**, Hassanalian M., Shao S., Roghanchi P., 2024, *Optimizing Fire Emergency Evacuation Routes in Underground Coal Mines: A Lightweight Network Flow Approach*, **Tunnelling and Underground Space Technology**, Vol. 146, Article 105637, Pergamon. <https://doi.org/10.1016/j.tust.2024.105637>
4. Lotero S., **Khaniani H.**, Androulakis V., Hassanalian M., Shao S., Roghanchi P., 2023, *Optimization for Fire Evacuation Applying Maximum Flow Cost Algorithm to Improve the Time-Response in Underground Coal Mines*, in **Underground Ventilation**, pp. 541–549, CRC Press. <https://doi.org/10.1201/9781003429241-55>
5. Dinelli C., Racette J., Escarcega M., Lotero S., Gordon J., Montoya J., Dunaway C., Androulakis V., **Khaniani H.**, Shao S., Roghanchi P., Hassanalian M., 2023, *Configurations and Applications of Multi-Agent Hybrid Drone/Unmanned Ground Vehicle for Underground Environments: A Review*, **Drones**, Vol. 7, Issue 2, Article 136, MDPI. <https://doi.org/10.3390/drones7020136>
6. McMillan M., Ampomah W., Will R., **Khaniani H.**, 2021, *Development of Time Lapse VSP Integration Workflow: A Case Study at Farnsworth CO₂-EOR Project*, **SPE Europec featured at 82nd EAGE Conference and Exhibition**, SPE. <https://doi.org/10.2118/205142-ms>
7. Nazari S., **Khaniani H.**, 2021, *Intelligent Trading and Risk Management Framework*, **U.S. Patent 2021065296**, issued March 4, 2021.
8. Fernández-Muñiz Z., **Khaniani H.**, Fernández-Martínez J. L., 2019, *Data Kit Inversion and Uncertainty Analysis*, **Journal of Applied Geophysics**, Vol. 161, pp. 228–238, Elsevier. <https://doi.org/10.1016/j.jappgeo.2018.12.022>
9. **Khaniani H.**, Bancroft J. C., von Lunen E., 2016, *Iterative Multiparameter Waveform Inversion of Precritical Reflection Data Using Prestack Time Kirchhoff Approximation*, **Geophysics**, Vol. 81, No. 1, pp. R15–R27, SEG. <https://doi.org/10.1190/geo2014-0560.1>
10. Acheampong S. A., Ampomah W., **Khaniani H.**, Will R., Sarkodie-Kyeremeh J., 2022, *Quantitative Interpretation of Time-Lapse Seismic Data at Farnsworth Field Unit: Rock Physics Modeling and Calibration of Simulated Time-Lapse Velocity Responses*, **Greenhouse Gases: Science and Technology**, Vol. 12, No. 6, pp. 671–697, Wiley. <https://doi.org/10.1002/ghg.2184>
11. Duane P., Christie A., Shao S., Androulakis V., **Khaniani H.**, Hassanalian M., Roghanchi P., 2026, *Optimal Sequential Node Deployment in Underground Mines with Partial Map Discovery*, **Tunnelling and Underground Space Technology**.
12. Bakzadeh R., Joao K. M., Androulakis V., **Khaniani H.**, Shao S., Hassanalian M., Roghanchi P., 2025, *Enhancing Emergency Response: The Critical Role of Interface Design in Mining Emergency Robots*, **Robotics**, Vol. 14, Issue 11, p. 148, MDPI. <https://doi.org/10.3390/robotics14110148>