Navid Bahrani

Senior Geomechanics Engineer

Expertise	Rock Mechanics, Geomechanics Instrumentation, Mining Engineering, Numerical Modelling
Education	Ph.D. (Natural Resources Engineering), 2015 Laurentian University, Sudbury, ON, Canada
	M.Sc. (Mining Engineering), 2009 University of Alberta, Edmonton, AB, Canada
	B.Sc. (Mining Engineering), 2006 Azad University, Tehran, Iran
Professional Affiliations	Member: Professional Engineers Ontario (PEO); Canadian Rock Mechanics Association (CARMA); International Society for Rock Mechanics and Rock Engineering (ISRM); American Rock Mechanics Association (ARMA); Canadian Institute of Mining, Metallurgy and Petroleum (CIM); Canadian Geotechnical Society (CGS)
Honors	2024 Peter Cundall Honorable Mention Award
	2021-2024 Future Leaders Program – American Rock Mechanics Association
	2021 Recognition Award for Technical Knowledge – Dalhousie Undergraduate Engineering Society
	2016 Peter Cundall Honorable Mention Award

Professional Experience

2025 – Present	Itasca Consulting Canada, Inc., Canada Senior Geomechanics Engineer
2025 – 2025	Itasca Consulting Group, Minneapolis, MN, USA Associate
2022 – 2024	Dalhousie University, Halifax, NS, Canada Associate Professor
2017 – 2022	Dalhousie University, Halifax, NS, Canada Assistant Professor
2021 – 2024	York University, Toronto, ON, Canada Adjunct Member
2015 – 2017	Lassonde Institute of Mining, University of Toronto, Toronto, ON, Canada Post-Doctoral Fellow

2008 – 2014	Geomechanics Research Centre, MIRARCO – Mining Innovation, Sudbury, ON, Canada
	Research Engineer
2012 – 2012	ITASCA Consulting Group, Minneapolis, MN, USA
	Summer Intern

Project Experience

Rock Mechanics Applied to Underground Mine Design: Performed stability analyses of underground excavations and evaluated rock mass behavior in hard rock mining environments. Designed support systems for mechanically excavated mine openings and assessed pillar stability. Provided consulting services to major mining companies, including Rio Tinto and Vale, utilizing advanced geomechanical modeling tools to evaluate excavation responses under varying geological and stress conditions.

Geomechanics Field-based Experience: Led extensive field investigations involving core logging, borehole imaging, rock mass characterization, and stress/strain monitoring. Implemented instrumentation systems for in-situ stress measurement using the HI-CSIRO overcoring technique; monitored deformation with extensometers and inclinometers; conducted fracture mapping via acoustic and optical televiewers; and assessed shotcrete quality using non-destructive testing techniques such as Ground Penetrating Radar (GPR) and 3D laser scanning. Notable field campaigns include work at Lac des Îles, Musselwhite, Creighton, Nickel Rim South, and Coleman mines.

Geomechanics Research Projects: Participated in various geomechanics studies bridging fundamental research and industry applications. Projects included stress redistribution around ventilation raises, rib pillar bulking assessment, and sill pillar strain monitoring. Also conducted a range of laboratory tests including uniaxial/triaxial compression, Brazilian tensile strength, point load index, and Cerchar abrasivity testing.

Numerical Modelling: Performed elastic and elasto-plastic analyses to evaluate the influence of support systems on excavation stability. Contributed to back-analysis of in-situ stresses, assessments of brittle failure around tunnels, and evaluation of excavation damage zones. A key focus was integrating Discrete Fracture Networks (DFNs) into continuum and discontinuum models to develop grain-based models that better represent rock heterogeneity and the evolution of brittle failure.