Navid Bahrani – Publications

PUBLICATIONS (JOURNALS)

Haris A. El Nagar H. Shahin M. & Bahrani N. 2025. Development of a Finite-Difference–Discrete-Element Coupled Model for Ram-Compacted Bearing Base Piles. International Journal of Geomechanics, 25(5): 14p. https://doi.org/10.1061/IJGNAI.GMENG-10393

Gomez LF. Corkum AG. Bahrani N. & Mas Ivars D. 2025. A sensitivity study and comparative robustness evaluation of the CWFS and DISL methods of brittle failure modelling around underground excavations. Tunnelling and Underground Space Technology, 161: 106523 https://doi.org/10.1016/j.tust.2025.106523

Amiri F. Bahrani N. Lisjak A. Mahabadi O. Ha J. & Li* Y. 2024. Influence of unloading-induced brittle damage on laboratory properties and behavior of hard rocks: Insights from the hybrid Finite-Discrete Element Method. Computers and Geotechnics, 176: 106766. https://doi.org/10.1016/j.compgeo.2024.106766

Amiri F. & Bahrani N. 2024. Continuum-based heterogenous models for capturing brittle damage and failure of hard rocks under loading and unloading conditions, Computers and Geotechnics, 165, 105917. https://doi.org/10.1007/s00603-023-03718-0

Hamediazad F. & Bahrani N. 2024. Evaluation of the rock mass strength for hard rock pillar design using bonded block models. Rock Mechanics and Rock Engineering, 57: 3659–3680. https://doi.org/10.1007/s00603-023-03718-0.

Sanipour S. Bahrani N. & Corkum A. 2022. Simulation of brittle failure around Canada's mine-by experiment tunnel using 2D continuum-based Voronoi tessellated models. Rock Mechanics and Rock Engineering, 55, 6387–6408. https://doi.org/10.1007/s00603-022-02969-7

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Naseri S. & Bahrani N. 2021. Design of initial shotcrete lining for a mine shaft using two-dimensional finite element method. Geotechnical and Geological Engineering, 39: 4709-4732. https://doi.org/10.1007/s10706-021-01773-4

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Bahrani N. & Kaiser PK. 2020. Influence of degree of interlock on confined strength of non-persistently jointed and blocky hard rock masses. Journal of Rock Mechanics and Geotechnical Engineering, 12(6): 1152-1170. https://doi.org/10.1016/j.jrmge.2020.06.004

Tomasone P. Bahrani N. & Hadjigeorgiou J. 2019. Practical considerations in the modelling of resin grouted rock bolts. The Journal of Southern African Institute of Mining and Metallurgy, 120(6): 385-392. http://dx.doi.org/10.17159/2411-9717/1010/2020

Bahrani N. Valley B. & Kaiser PK. 2019. Influence of stress path on stress memory and stress fracturing in brittle rocks. Canadian Geotechnical Journal, 56: 852-867. https://doi.org/10.1139/cgj-2018-0291

Bahrani N. & Hadjigeorgiou J. 2018. Influence of stope excavation on drift convergence and support behavior - insights from 3D continuum and discontinuum models. Rock Mechanics and Rock Engineering, 51: 2395-2413. https://doi.org/10.1007/s00603-018-1482-5

Bahrani N. & Hadjigeorgiou J. 2017. Explicit reinforcement models for fully-grouted rebar rock bolts. Journal of Rock Mechanics and Geotechnical Engineering, 9: 267-280. https://doi.org/10.1016/j.jrmge.2016.07.006

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Bahrani N. Kaiser PK. & Valley B. 2014. Distinct element method simulation of an analogue for a highly interlocked, non-persistently jointed rockmass. International Journal of Rock Mechanics and Mining Sciences, 71: 117-130. https://doi.org/10.1016/j.ijrmms.2014.07.005

Bewick RP. Kaiser PK., Bawden WF. & Bahrani N. 2014. DEM simulation of direct shear: 1. Rupture under constant normal stress boundary conditions. Rock Mechanics and Rock Engineering, 47: 1647-1671. https://doi.org/10.1007/s00603-013-0490-8

Bahrani N. & Kaiser PK. 2013. Strength degradation of non-persistently jointed rockmass. International Journal of Rock Mechanics and Mining Sciences, 62: 28-33. https://doi.org/10.1016/j.ijrmms.2013.03.013

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PUBLICATIONS (CONFERENCES)

Chen B. & Bahrani N. 2025. Capturing laboratory properties and behavior of defected marble using 2D grain-based continuum models. In: Proceedings of Canadian Geotechnical Conference, GeoManitoba 2025, Manitoba, Canada, 7p.

Gomez de Alba LF. Corkum A. Bahrani N. 2025. Mas-Ivars D. Monte Carlo simulation of the cohesion weakening and frictional strengthening approach for assessment of brittle failure around underground excavations. ISRM International Symposium, Eurock 2025, Trondheim, Norway, 5p.

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Hamediazad F. Bahrani N. Moallemi S. & Yacoub T. 2024. A 3D continuum-based Voronoi Tessellated Model (VTM) for hard rocks. 58th US Rock Mechanics Symposium, Golden, Colorado, ARMA 24-0552

Hamdi P. Achtziger P. Dickmann J. Kruszewski M. Rinaldi AP. Villiger L. Shakas A. Perras M. Bahrani N. Jiang D. Amann F. & Wiemer S. 2024. Progressive excavation disturbance zone evolution during and post mine-by tunnelling (PRECODE) – Insight into a new underground research laboratory for crystalline rocks in the BedrettoLab. 58th US Rock Mechanics Symposium. Golden, Colorado, ARMA 24-0543

Perras M. Golabchi Y. Bahrani N. Hamdi P. & Amann F. 2024. Intact rock properties of the Rotondo Granite for the PRECODE project in the BedrettoLab. 58th US Rock Mechanics Symposium. Golden, Colorado, ARMA 24-0438

Amiri F. Bahrani N. Lisjak A. Mahabadi O. & Ha J. 2024. Capturing unloading-induced damage using the finite-discrete element method. EUROCK Conference, Alicante, Spain, 6p.

Hamediazad F. & Bahrani N. 2024. Investigating the strength and failure mechanism of hard rock pillars using Bonded Block Models. 6th Itasca International Symposium, Toronto, Canada, 5 p.

Gomez de Alba L. Corkum A. & Bahrani N. 2024. Application of the CWFS method in FLAC2D to model brittle failure around the Qirehataer Diversion tunnel. 6th Itasca International Symposium, Toronto, Canada, 6 p. Paper Received Peter Cundall Honourable Mention Award

Li Y. & Bahrani N. 2024. Investigating the influence of joint persistence on pillar strength using the hybrid finite-discrete element method. GeoMontreal Conference, Canadian Geotechnical Society, Montreal, Canada, 9p.

Gomez de Alba L. Trzop M. & Bahrani N. 2024. Re-assessing the strength of hard rock pillars using the Hoek-Brown brittle parameters and the DISL methods. GeoMontreal Conference, Canadian Geotechnical Society, Montreal, Canada, 9p.

Bahrani N. Sanipour S. & Hamediazad F. 2024. The strength of massive to moderately jointed hard rock masses for tunnel and pillar design. Deep Mining 2024, Australian Centre for Geomechanics. Montreal, Canada.

Bahrani N. Li Y. Hamediazad F. Sanipour S. & Amiri F. 2023. Application of continuum-based Voronoi tessellated models for simulating brittle damage and failure in hard rocks, International Rocscience Conference (IRC), Toronto, Canada, 9 p.

Hamediazad F. & Bahrani N. 2023. Stability analysis of hard rock pillars under compressive and shear loading conditions using 2D and 3D numerical modeling International Rocscience Conference (IRC), Toronto, Canada, 11 p. (HQP won the Best Student Paper Competition award)

Amiri F. & Bahrani N. 2023. Continuum-based Voronoi tessellated models for capturing unloading-induced brittle damage in hard rocks. International Rocscience Conference (IRC), Toronto, Canada, 9 p.

Naseri S. & Bahrani N. 2022. Stability analysis of shotcrete lining for a mine shaft using the finite-discrete element method. 56th US Rock Mechanics/Geomechanics Symposium, New Mexico, USA.
Sanipour S. Bahrani N. & Corkum A. 2021. A 2D continuum-based Voronoi tessellated model for Lac du Bonnet granite. GeoNiagara, Canadian Geotechnical Society, 9p.

Hamediazad F. & Bahrani N. 2021. Numerical simulation of hard rock pillars under compressive and shear loading conditions. GeoNiagara, Canadian Geotechnical Society, 8p.

Li Y. & Bahrani N. 2020. A numerical study on the failure process and strength of heterogeneous rocks and highly interlocked jointed pillars. 54th US Rock Mechanics/Geomechanics Symposium, Colorado, USA.

Bahrani N. & Valley B. 2020. Capturing non-linear stress-strain response of brittle rocks due to closure of coring-induced micro-cracks using 3D bonded block model. 54th US Rock Mechanics/Geomechanics Symposium, Colorado, USA.

Bahrani N. & Hadjigeorgiou J. 2020. A numerical modeling approach for estimating the rock mass post-peak deformation modulus near a mine drift. 5th International Itasca Symposium, Vienna, Austria, 5p.

Bahrani N. & Valley B. 2020. Three-dimensional numerical simulation of drilling-induced core damage using block bonded model. 5th International Itasca Symposium, Vienna, Austria, 5p.

Naseri S. & Bahrani N. 2019. Stability assessment of initial shotcrete lining using a 2D continuum modeling approach. 9th International Symposium on Ground Support in Mining and Underground Construction, Sudbury, ON, Canada, 15p.

Bahrani N. Kaiser PK. & Corkum A. 2018. Suggested methods for estimation of confined strength of heterogeneous (defected) rocks, Caving 2018, Vancouver, Canada, 15p.

Bahrani N. & Hadjigeorgiou J. 2017. Some issues in modeling of ground support using the three-dimensional distinct element method, Deep Mining 2017, Perth, Australia, 14p.

Bahrani N. & Kaiser PK. 2016. Strength degradation approach (SDA) for estimation of confined strength of micro-defected rocks. Proc. of 50th US Rock Mechanics/Geomechanics Symposium, Houston, USA, 9p.

Bahrani N. & Kaiser PK. 2016. Integrated grain-based-DFN model for simulation of defected rock. Proc. of 4th Itasca Symposium on Applied Numerical Modeling, Lima, Peru, 13p.

Bahrani N. Valley B. & Kaiser PK. 2014. Distinct element method simulation of stress fracturing around underground opening. Proc. EUROCK, Vigo, Spain, 6p.

Bahrani N. Yong S. Valley B. & Maloney S. 2013. Stress measurement: the GRC perspective. Proc. World Mining Congress, Montreal, Canada, 10p.

Bahrani N. Purvance M. & Emam S. 2013. A comparison between 2D and 3D bonded-particle models for rock. 47th US Rock Mechanics/Geomechanics Symposium, San Francisco, USA.

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Bahrani N. Potyondy DO. & Pierce M. 2012. Simulation of Brazilian test using PFC2D grain-based model. Proc. 21st Canadian Rock Mechanics Symposium, Edmonton, Canada, 9p.

Valley B., Kim B. Suorineni FT. Bahrani N. Bewick RP. & Kaiser PK. 2011. Influence of confinement dependent failure processes on rock mass strength at depth. Proc. 12th ISRM International Congress on Rock Mechanics, Beijing, China, 6 p.

Bahrani N. Valley B. Kaiser PK. 2011. Discrete element modeling of drilling-induced core damage and its influence on laboratory properties of Lac du Bonnet granite. Proc. 45th US Rock Mechanics Symposium, San Francisco, USA, 9 p.

Bahrani N. Valley B. Kaiser PK. & Pierce M. 2011. Evaluation of PFC2D Grain-Based Model for simulation of confinement-dependent rock strength degradation and failure processes. Proc. 45th US Rock Mechanics Symposium, San Francisco, USA, 11 p.

Bahrani N. Suorineni FT. & Maloney S. 2010. Pillar stability assessment approach for mechanized and drill and blast excavations, Proc. 44th US Rock Mechanics Symposium, Salt Lake City, UT, USA, 9 p.

Valley B. Bahrani N. & Kaiser PK. 2010. Rock strength obtained from core samples and borehole instabilities – the effect of drilling induced damage, Proc. EUROCK 2010, Switzerland, 4 p.

Bahrani N. & Tannant DD. 2009. Numerical modeling of shear stress and displacement reversals as the pit floor passes a high wall and implications for shear strength degradation, Proc. 3rd Canada-US Rock Mechanics Symposium & 20th Canadian Rock Mechanics Symposium, Toronto, Canada, 12 p.

Tannant DD. Bahrani N. & Gulati VA. 2008. Bedding surface roughness profile and estimated dilation angles, Proc. Canadian Geotechnical Conference, Edmonton, 8 p.

Bahrani N. & Asadi A. 2006. Physical modeling of surface subsidence due to longwall mining of inclined coal seams, Proc. 5th Student Mining Engineering Conference, Isfahan, Iran (in Persian).