

## Mohammad Darbor

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## Research Interests

Rock Mechanics, Tunnelling, Wear, Artificial Intelligence, Monitoring Plans and Data Processing, Numerical Modelling, Mining Engineering.

## Educations

2013-2018 **PhD**, Rock Mechanics Engineering, **Isfahan University of Technology**, Isfahan, Iran.

*Thesis Title:* Study of anisotropy effect on mechanical properties, drilling penetration rate and specific energy of rocks, (GPA: 18.98).

2016-2017 **Sabbatical**, Rock Mechanics Engineering, **Curtin University**, Kalgoorlie, WA, Australia.

2008-2010 **MSc**, Rock Mechanics Engineering, **Amirkabir University of Technology**, Tehran, Iran.

*Thesis Title:* Vulnerability and estimation of safety factors in the upstream walls of Latyan dam using numerical simulation, (GPA: 17.23).

2004-2008 **BSc**, Mining Engineering, **Shahid Bahonar University of Kerman**, Iran, (GPA: 18.90).

## Work Experiences

- Dec 2023-Present, **Associate Professor**, Department of Mining Engineering, Sahand University of Technology, Tabriz, Iran.
- March 2021-Present, **Dean of The College of Varzeghan Engineering**, Department of Mining Engineering, Sahand University of Technology, Iran.
- April 2018-Dec 2023, **Assistant Professor**, Department of Mining Engineering, Sahand University of Technology, Tabriz, Iran.
- Oct 2024-Present, **Advisor of the Scientific Association**, The college of Varzeghan Engineering, Varzeghan, Iran.

- Aug 2024-Present, **Expert of the Mining Engineering Organization of East Azerbaijan**, Tabriz, Iran.
- Jan 2023-May 2023, **The scientific manager of the employment test**, Sungun Copper Complex, Varzeghan, Iran.
- Sep 2022-Sep 2023, **Central member of the Rock Mechanics Committee**, Iranian Mining Engineering Organization.
- Sep 2022-Present, **Mining technical responsible person**, Mining Engineering Organization of East Azerbaijan, Tabriz, Iran.
- Sep 2020-Sep 2023, **Advisor of the Scientific Association**, The College of Varzeghan Engineering, Varzeghan, Iran.
- Feb 2020-April 2020, **The scientific manager of the employment test**, Tabriz Oil Refining Company, Tabriz, Iran.
- August 2015- Sep 2022, **Mining technical responsible person**, Mining Engineering Organization of Isfahan, Isfahan, Iran.
- Sep 2012-Sep 2013, **Lecturer**, Department of Mining Engineering, Sahand University of Technology, Tabriz, Iran.
- May 2011-Sep 2012, **Senior Mining Engineer**, Shargh Cement Co., Mashhad, Iran.
- Feb 2011-May 2011, **Geotechnical Engineer**, Kavoshgaran Consulting Engineers, Tehran, Iran.
- August 2008-August 2015, **Mining technical responsible person**, Mining Engineering Organization of Razavi Khorasan, Mashhad, Iran.

## Honors and Awards

- Member of Iran's National Elites Foundation, 2008-Present.
- Top teaching professor of The College of Varzeghan Engineering, Sahand University of Technology, 2024.
- The leading educational professor, Sahand University of Technology, 2023.
- The best professor of student evaluation, Sahand University of Technology, 2023.
- Top teaching professor of Faculty of Mining Engineering, Sahand University of Technology, 2022.
- Top researcher, Appreciation festival of the top researchers and technologists of Sahand University of Technology, 2021.
- Iran's top graduate award, Iran's National Elites Foundation, 2019.
- 1st rank among all PhD students graduated at Department of Mining Engineering (GPA: 18.98), Isfahan University of Technology, 2018.
- Winner of a 12342 AUD scholarship from Ministry of Science, Research and Technology of Iran for sabbatical at the Curtin University, Kalgoorlie, WA, Australia, 2016.
- 5th rank at the PhD entrance exam of Iran universities, 2013.
- The top young man of North Khorasan province, North Khorasan Governorate, 2011.

- Research and Innovation Award of the Iran's National Elites Foundation, 2010.
- A Patent confirmed at Iran's National Elites Foundation, 2010.
- Exceptional talent during the Master of science at Department of Mining Engineering (GPA: 17.23), Amirkabir University of Technology, 2010.
- 1st rank among all BSc students graduated at Department of Mining Engineering (GPA: 18.90), Shahid Bahonar University of Kerman, 2008.

## Patents

- The Simulation Process of Slope Stability in Rock Structures, Iranian State Organization of Lands and Deeds Registration, No. & Date of Patent: 62421-15/12/2009.

## Memberships

- Iran's National Elites Foundation
- Iranian Mining Engineering Organization
- Central member of the Rock Mechanics Committee of East Azerbaijan Mining Engineering Organization.

## Publications (Peer-Reviewed Journal Papers)

- **Darbor, M.**, Chakeri, H., Tabarmaye, M., Baghali, H., Talebinejad, A. (2024). Risk analysis and reducing measures in tunneling project of Tabriz metro line 2, *Journal of Analytical and Numerical Methods in Mining Engineering*, Accepted.
- Khoshzaher, E., Miri Darmarani, Sh., Chakeri, H., **Darbor, M.**, Haghkish, H. (2024). The influence of fiber-reinforced shotcrete on the ground settlement in tunnel excavation: A case study of Tabriz metro line 2, *International Journal of Mining and Geo-Engineering*, Accepted.
- Chakeri, H., **Darbor, M.**, Shakeri, H., Mousapour, H., Mohajeri, V. (2024). Experimental and numerical investigation of the TBM disc cutter wear using a new tunnel boring machine laboratory simulator, *Helvion*, 10(17), e37148.
- **Darbor, M.**, Chakeri, H., Manafi, M., Balani, A. (2024). Stability analysis and design of support system for adits of the gold deposits of Mazraeh-Shadi using numerical modeling, *Journal of Analytical and Numerical Methods in Mining Engineering*, Accepted.
- Barri, F., Chakeri, H., **Darbor, M.**, Haghkish, H. (2024). The effect of soil and grout mixture on the ground surface settlement in mechanized excavation, *Journal of Mining and Environment*, 15(4), 1607-1626.
- Ansari, T., Chakeri, H., **Darbor, M.**, Amoun, S., Shakeri, H. (2024). Investigating the effect of soil grading parameters on the tool wear in mechanized tunneling using EPB-TBM machine, *Journal of Mining and Environment*, 15(1), 301-321.

- Khodae Ashestani, S., Chakeri, H., **Darbor, M.**, Khoshzaher, E., Bazargan, Sh. (2024). Estimating penetration rate of excavation machine using geotechnical parameters and neural networks in Tabriz metro, *Journal of Analytical and Numerical Methods in Mining Engineering*, 13(37), 1-9.
- Chakeri, H., **Darbor, M.**, Sh. Maleki, F., Minaee, T. (2023). Experimental investigation of steel fibers' effect on the improvement of mechanical properties of concrete segmental lining in mechanized tunneling, *Rudarsko-geološko-naftni zbornik*, 38(3), 55-63.
- Nickjouye Tabrizi, AH., Chakeri, H., **Darbor, M.**, Amoun, S. Shakeri, H. (2023). Evaluating the effect of tool wear in soft soil using new TBM tunneling simulator device, *Journal of Testing and Evaluation*, 51(6).
- Mousapour, H., Chakeri, H., **Darbor, M.**, Hekmatnejad, A. (2023). Evaluating the wear of cutting tools using a tunnel boring machine laboratory simulator, *Mining of Mineral Deposits*, 17(2), 28-34.
- Khoshzaher, E., Chakeri, H., **Darbor, M.**, Shakeri, H. (2023). The effects of water content and grain size on the clogging and abrasivity of fine-grained soils in mechanized excavation, *Rudarsko-geološko-naftni zbornik*, 38(2), 65-74.
- Nikjou Tabrizi, AH., Chakeri, H., **Darbor, M.**, Shakeri, H. (2023). The effect of TBM operational parameters on the wear of cutting tools using a tunnel boring machine laboratory simulator, *Journal of Analytical and Numerical Methods in Mining Engineering*, 12(33), 55-63.
- Faramarzi, L., **Darbor, M.**, Ebrahimi, B., Hoseinie, S. H. (2023). The effect of anisotropy on the mechanical properties of artificial rock mass based on laboratory physical modelling, *Journal of Analytical and Numerical Methods in Mining Engineering*, 13(35), 51-62.
- **Darbor, M.**, Chakeri, H., Ansari, T. (2022). The influence of soil particle size distribution on the abrasion of EPB machine cutting tools, *Ferdowsi Civil Engineering*, 35(4), 17-34, (In Persian).
- Chakeri, H., Aghababaei, H., **Darbor, M.**, Mostafaei Daneshmand, H. (2022). Evaluation of reliability, availability and maintainability of back-up locomotives in earth pressure balance tunnel boring machine (EPB-TBM): A case study: Tabriz metro line 1, *Iranian Journal of Mining Engineering*, 17(57), 68-88, (In Persian).
- Shamsoddin Saeed, M., Jalalifar, H., Shamsoddini, H., **Darbor, M.** (2022). A comparative study on the application of Regression-PSO and ANN methods to predict backbreak in open-pit mines, *Journal of Analytical and Numerical Methods in Mining Engineering*, 11(29), 55-66.
- **Darbor, M.**, Chakeri, H., Asgharzadeh Dizaj, M. (2021). Investigation of the effect of different parameters on the penetration rate of earth pressure balance boring machine using fuzzy and neuro-fuzzy methods, and metaheuristic algorithms (A case study: Tabriz metro line 2), *Journal of Analytical and Numerical Methods in Mining Engineering*, 10(25), 43-60.

- **Darbor, M.**, Shakeri, H. (2021). Experimental study of the effects of sample geometry on hydraulic fracturing under triaxial stresses, *Journal of Engineering Geology*, 15(1), 67-94, (In Persian).
- Ashrafi, J., Faramarzi, L., **Darbor, M.**, Sharifzadeh, M., Ferdosi, B. (2020). The effects of temperature on the mechanical properties of rocks. *International Journal of Mining and Geo-Engineering*, 54(2), 147-152.
- **Darbor, M.**, Shakeri, H. (2019). A laboratory study of the effects of stress regimes on hydraulic fracturing. *Journal of Petroleum Geomechanics*, 3(3), 45-59, (In Persian).
- **Darbor, M.**, Shakeri, H., Faramarzi, L. (2019). Experimental study of the perforation effect on hydraulic fracturing under triaxial stresses using physical modeling. *Journal of Analytical and Numerical Methods in Mining Engineering*, 9(20), 89-104, (In Persian).
- **Darbor, M.**, Faramarzi, L., Sharifzadeh, M. (2019). Performance assessment of rotary drilling using non-linear multiple regression analysis and multilayer perceptron neural network. *Bulletin of Engineering Geology and the Environment*, 78(3), 1501-1513.
- **Darbor, M.**, Faramarzi, L., Sharifzadeh, M. (2019). Size-dependent compressive strength properties of hard rocks and rock-like cementitious brittle materials. *Geosystem Engineering*, 22(4), 179-192.
- **Darbor, M.**, Faramarzi, L., Sharifzadeh, M., Rezaee, H. (2019). Evaluation of specimen size-effect in sedimentary rocks and grain size effect in concrete specimens on uniaxial compressive strength. *Journal of Analytical and Numerical Methods in Mining Engineering*, 8(16), 57-70, (In Persian).
- Behzadi Nezhad, H., Faramarzi, L., **Darbor, M.** (2017). Stability analysis and support system design of penstock tunnels bifurcation with headrace tunnel of Rudbare-Lorestan dam project. *Journal of Analytical and Numerical Methods in Mining Engineering*, 7(13), 113-123, (In Persian).
- Rahmati, A., Faramarzi, L., **Darbor, M.** (2017). Squeezing rock conditions at phyllite-slate zone in the Golab water conveyance tunnel, Iran: a case study. *Journal of Central South University*, 24(10), 2475-2485.

### **Publications (Conference Papers)**

- Mousapour, H., **Darbor, M.** (2024). Investigation of instability in limestone mining stopes: A case study, *4th. International Conference on Architecture, Civil Engineering, Urban Development and Environment*, Tabriz Islamic Art University, Tabriz, Iran.
- Khoshzaher, E., Chakeri, H., **Darbor, M.**, Mousapour, H. (2024). Laboratory study of the effect of clogging in mechanized excavation, *2nd International conference & 5th National Conference on laboratory Equipment and Technologies*, Sahand University of Technology, Tabriz, Iran.
- Mousapour, H., Chakeri, H., **Darbor, M.**, Khoshzaher, E. (2024). Analyzing the wear of cutting tools using a tunnel boring machine laboratory, *2nd International conference & 5th*

*National Conference on laboratory Equipment and Technologies, Sahand University of Technology, Tabriz, Iran.*

- Kouhi, H., Baghali, H., Chakeri, H., **Darbor, M.** (2024). The effect of slurry injection and soil properties on ground surface settlement in mechanized excavation, *14th National Congress on Civil Engineering*, University of Zanjan, Zanjan, Iran.
- **Darbor, M.**, Chakeri, H., Mousapour, H., Khoshzaher, E. (2023). Slope stability analysis of open pit mine by limit equilibrium analysis method, *3rd. International Conference on Architecture, Civil Engineering, Urban Development and Environment*, Tabriz Islamic Art University, Tabriz, Iran.
- **Darbor, M.**, Khoshzaher, E., Mousapour, H. (2023). The stability analysis of Masjid Daghi copper mine by kinematic method, *3rd. International Conference on Architecture, Civil Engineering, Urban Development and Environment*, Tabriz Islamic Art University, Tabriz, Iran.
- Khodaei, S., **Darbor, M.**, Chakeri, H. (2023). Investigating the liquefaction potential of the western shaft up to E2 station of Tabriz metro line 2, *3rd. International Conference on Architecture, Civil Engineering, Urban Development and Environment*, Tabriz Islamic Art University, Tabriz, Iran.
- **Darbor, M.** (2023). Slope stability analysis and determining the required support system of unstable structures, a case study, *10th National Conference on Modern Studies and Research in Civil Engineering, Architecture and future city*, Tehran, Iran.
- **Darbor, M.**, Khoshzaher, E., Manafi, M. (2023). Rock mass engineering classification of the tunnel route, a case study, *10th National Conference on Modern Studies and Research in Civil Engineering, Architecture and future city*, Tehran, Iran.
- **Darbor, M.**, Mousapour, H., Manafi, M. (2023). Stability analysis of mineral access tunnels using numerical modeling, a case study, *10th National Conference on Modern Studies and Research in Civil Engineering, Architecture and future city*, Tehran, Iran.
- Amoun, S., Chakeri, H., **Darbor, M.** (2022). A new approach for tunnel support system design, *13th National Congress on Civil Engineering*, Isfahan University of Technology, Isfahan, Iran.
- Amoun, S., Chakeri, H., **Darbor, M.** (2022). Evaluation of wear in Tehran metro tunnel line 7, Iran, *13th National Congress on Civil Engineering*, Isfahan University of Technology, Isfahan, Iran.
- Khoshzaher, E., Mousapour, H., **Darbor, M.**, Chakeri, H. (2022). The effect of soil conditioning using foam on reducing clogging and wear of cutting tools of EPB machines, *2nd. International Conference on Architecture, Civil Engineering, Urban Development and Environment*, Tabriz Islamic Art University, Tabriz, Iran.
- Mousapour, H., Khoshzaher, E., **Darbor, M.**, Chakeri, H., Haghkish, H. (2022). Evaluation of liquefaction potential in Tabriz Metro Lines 2 and 4, *2nd. International Conference on Architecture, Civil Engineering, Urban Development and Environment*, Tabriz Islamic Art University, Tabriz, Iran.

- Samimi Namin, F., Chakeri, H., **Darbor, M.**, Taheri, E., Khoshzaher, E., (2022). Numerical study of the effect of mechanized excavation on the subsidence rate of Tabriz Metro Line 2, *2nd. International Conference on Architecture, Civil Engineering, Urban Development and Environment*, Tabriz Islamic Art University, Tabriz, Iran.
- **Darbor, M.**, Nikjou Tabrizi, AH., Chakeri, H., Shakeri, H. (2020). Comparative study of soil abrasion tests, *The Second National Conference on Modeling in Mining Engineering and Related Sciences*, Imam Khomeini International University, Ghazvin, Iran.
- **Darbor, M.**, Manafi, M., Shakeri, H. (2020). Modelling of geotechnical boreholes required for open pit mines, Case study: Sungun copper-molybdenum deposit, *Second National Conference on Knowledge-Based Research in Earth Sciences*, Shahid Chamran University of Ahvaz, Ahvaz, Iran.
- **Darbor, M.**, Moarefvand, P. (2018). The numerical simulation of the Lar dam site using 3DEC software. *5th International Mine and Mining Industries Congress*, Tehran, Iran.
- **Darbor, M.**, Salari-Rad, H., (2018). Hydraulic and dynamic analysis of the left abutment of Latyan dam and determination of stabilization plan using numerical simulation, *National Conference on New Approaches in Civil Engineering, Architecture and Geographic Sciences*, Tehran, Iran.
- **Darbor, M.** (2018). Estimation of strength properties of rocks using block index test, *National Conference on New Approaches in Civil Engineering, Architecture and Geographic Sciences*, Tehran, Iran.
- **Darbor, M.**, Faramarzi, L. (2018). The scale effect on uniaxial compressive strength of rock and concrete specimens using specimen size effect models, *National Conference on New Approaches in Civil Engineering, Architecture and Geographic Sciences*, Tehran, Iran.
- **Darbor, M.**, Salari-Rad, H., Moarefvand, P. (2012). Study of safety factors, distribution of pore pressure and stabilization plan of left abutment of Latyan dam using limit equilibrium and numerical modelling methods, *International Mining Congress*, Tehran, Iran.
- **Darbor, M.**, Salari-Rad, H., Moarefvand, P. (2011). Vulnerability, estimation of safety factors and stabilization method of left abutment of Latyan dam using numerical simulation, *4th Iranian Rock Mechanics Conference*, Tehran, Iran.
- **Darbor, M.**, Jalalifar, H., Moarefvand, P. (2010). A developed technique to predict support system for plane failure, *ISRM International Symposium and 6th Asian Rock Mechanics Symposium*, New Delhi, India.
- **Darbor, M.**, Jalalifar, H., Moarefvand, P. (2010). Software design for direct determination of the required support system for prevention of planar failure; case study: Lead and zinc mine of Angoran, Zanjan, *International Mining Congress*, Tehran, Iran.
- **Darbor, M.**, Jalalifar, H., (2008). Slope stability analysis using S.S.A software, *2nd Iranian Mining Engineering Conference*, University of Tehran, Tehran, Iran.

## Teaching Experiences

- PhD: Advanced fracture mechanics, Mechanics of strata and methods of control
- MSc: Advanced rock mechanics, Continuous and discontinuous mechanics in rock, Advanced strength of materials
- BSc: Geotechnical engineering, Drilling methods, Statics (Engineering mechanics), Strength of materials, HSE, Technical services in mines.

## Supervised MSc Theses

- Vahid Mohajeri, (2023). Laboratory study of wear of cutting tools of excavation machines in rock, (Chakeri and **Darbor**).
- Amin Maleki, (2023). Laboratory and numerical investigation of TBM disc cutter life in different rocks, (Chakeri and **Darbor**).
- Haniyeh Kouhi, (2023). The effects of backfill grout on the ground surface settlement in mechanized excavation, (Chakeri and **Darbor**).
- Erfan Khoshzaher, (2022). Laboratory study of the effect of clogging in mechanized excavation, (Chakeri and **Darbor**).
- Hamid Mousapour, (2022). Investigation of the effect of machine performance parameters on wear of cutting tools in mechanized excavation (Chakeri and **Darbor**).
- Taha Ansari, (2021). Investigation of soil gradation effects on the abrasivity of EPB machine tools, (Chakeri and **Darbor**).
- Amir Hossein Nickjou Tabrizi, (2021). Effect of soil shear properties on the abrasivity of EPB machine tools, (Chakeri and **Darbor**).
- Mohammad Asgharzadeh Dizaj, (2019). Prediction performance of tunnel boring machine using fuzzy logic intelligent method (case study Tabriz metro line 2), (Chakeri and **Darbor**).

## Journal Reviews

- Journal of Rock Mechanics and Geotechnical Engineering
- Bulletin of Engineering Geology and the Environment
- Results in Engineering
- Geotechnical Engineering (Proceedings of the ICE)
- Transport (Proceedings of the ICE)
- Structural Concrete
- Structural Engineering and Mechanics
- Rudarsko-geološko-naftni zbornik
- Journal of Mining and Environment
- International Journal of Mining and Geo-Engineering
- Ferdowsi Civil Engineering (In Persian)
- Journal of Petroleum Geomechanics (In Persian)



- Journal of Analytical and Numerical Methods in Mining Engineering (In Persian)
- Journal of Engineering Geology (In Persian).

### **Software Skills**

- Rocscience Software Programs (SWEDGE, UNWEDGE, SLIDE, DIPS, RocFALL, RocPlane)
- Itasca Packages (Flac 2D, Flac 3D, UDEC, 3DEC and PFC)
- Mining Operations Software (Datamine)
- AutoCAD
- GIS (ArcView).

### **International Invitations**

- Invitation for Sabbatical, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile, 2023.
- Sabbatical at The Western Australian School of Mines, Curtin University, Kalgoorlie, WA, Australia, 2016/11-2017/5.
- Invitation for Sabbatical, University of Porto, Portugal, 2016.
- Invitation for Sabbatical, Hacettepe University, Turkey, 2015.