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Mineral Based Materials and Mechanics
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Prizes

Aalto University School of Engineering Award for Achievements in Teaching 2019
Janiszewski, M. (Recipient) & Uotinen, L. (Recipient), Jan 2020

Best poster award
Uotinen, L. (Recipient), 26 Sept 2013

Best poster award
Uotinen, L. (Recipient), 20 Sept 2012

Sinorock prize for Best Paper by Young Person outside China
Uotinen, L. (Recipient), 20 Jun 2013

Young Rock Engineer Award
Uotinen, L. (Recipient), 24 Sept 2021

Projects

EMMEP/EMC: EMMEP/EMC
Paaso, M. (Project Member), Janiszewski, M. (Project Member), Antikainen, J. (Project Member), Uotinen, L. (Project Member) & Rinne, M. (Principal investigator)
01/01/2014 → 31/12/2018

Fractusan
Rinne, M. (Principal investigator), Sirkiä, J. (Project Member), Oraskari, J. (Project Member), Karttunen, S. (Project Member), Szydlowska, M. (Project Member), Uotinen, L. (Project Member) & Savikko, H. (Project Member)
12/06/2017 → 31/01/2019

GAGS: Geophysical and Geochemical Methods for Stope Design
Baghbanan, A. (Project Member), Kangas, L. (Project Member), Lange, M. (Project Member), Rinne, M. (Principal investigator), Janiszewski, M. (Project Member), Leveinen, J. (Project Member), Kiuru, R. (Project Member), Laine, I. (Project Member), Uotinen, L. (Project Member) & Kangas, L. (Project Member)
01/10/2018 → 31/05/2022

I2Mine (CP Large)
Rinne, M. (Principal investigator), Uotinen, L. (Project Member), Mishra, R. (Project Member), Szydlowska, M. (Project Member), Janiszewski, M. (Project Member), Siren, T. (Project Member), Sirkiä, J. (Project Member), Song, Z. (Project Member), Dong, S. (Project Member) & Samimi Namin, F. (Project Member)
01/11/2011 → 31/10/2016

ORMID: On-line Risk Management in Deep Mines
Rinne, M. (Principal investigator), Uotinen, L. (Project Member), Mishra, R. (Project Member), Siren, T. (Project Member), Janiszewski, M. (Project Member), Szydlowska, M. (Project Member), Caballero Hernandez, E. (Project Member), Kiuru, R. (Project Member) & Kantia, P. (Project Member)
01/03/2016 → 31/12/2019

RAKKA: Rakoilleen kalliomassan vedenjohtavuus
Rinne, M. (Principal investigator), Uotinen, L. (Project Member) & Torkan, M. (Project Member)
01/02/2019 → 31/01/2020

RAKKA 2020: Rakoilleen kalliomassan vedenjohtavuus
Rinne, M. (Principal investigator), Torkan, M. (Project Member) & Uotinen, L. (Project Member)
01/02/2020 → 31/01/2021

RAKKA2021 (VYR/KYT2022): Rakoilleen kalliomassan vedenjohtavuus
Rinne, M. (Principal investigator), Torkan, M. (Project Member) & Uotinen, L. (Project Member)
01/02/2021 → 31/01/2022

RAKKA2022 (VYR/KYT2022): Rakoilleen kalliomassan vedenjohtavuus
Rinne, M. (Principal investigator), Torkan, M. (Project Member) & Uotinen, L. (Project Member)
01/01/2022 → 31/01/2023

Reaaliaikainen kalliomekaaninen malli
Rinne, M. (Principal investigator) & Uotinen, L. (Project Member)
01/01/2014 → 31/12/2015

REMOS: REMOS TUTL
Rinne, M. (Principal investigator), Karttunen, S. (Project Member), Hulkkonen, T. (Project Member), Janiszewski, M. (Project Member), Tiainen, J. (Project Member) & Uotinen, L. (Project Member)
01/06/2019 → 30/04/2021

MIRKA_2023 (VYR/SAFER2028): Scale-effect in fractured rock mass
Rinne, M. (Principal investigator), Uotinen, L. (Project Member) & Shpata, N. (Project Member)
01/01/2023 → 31/01/2024

MIRKA_2024 (VYR/SAFER2028): Scale-effect in fractured rock mass
Rinne, M. (Principal investigator), Uotinen, L. (Project Member) & Torkan, M. (Project Member)
01/01/2024 → 31/01/2025

Tackling the Challnges of a Solar Community Concept in High latitudes
Rinne, M. (Principal investigator), Uotinen, L. (Project Member), Janiszewski, M. (Project Member), Siren, T. (Project Member) & Caballero Hernandez, E. (Project Member)
01/01/2015 → 31/12/2017

VYR KARMO II
Rinne, M. (Principal investigator), Uotinen, L. (Project Member), Antikainen, J. (Project Member) & Sirkiä, J. (Project Member)
01/02/2015 → 31/01/2016

VYR KARMO III 2017
Rinne, M. (Principal investigator), Caballero Hernandez, E. (Project Member) & Uotinen, L. (Project Member)
01/01/2017 → 31/01/2018

VYR KARMO III 2018
Rinne, M. (Principal investigator), Caballero Hernandez, E. (Project Member), Szydlowska, M. (Project Member) & Uotinen, L. (Project Member)
01/02/2018 → 31/01/2019

Activities

International Workshop on Fracturing Geomechanics
Janiszewski, M. (Member), Rinne, M. (Chair), Uotinen, L. (Member), Hedström, O. (Member), Suikkanen, J. (Member), Shen, B. (Chair) & Stephansson, O. (Member)
12 Jun 2019 → 13 Jun 2019

Eurock 2015, Salzburg, 6.10.-9.10.2015, Austria
Uotinen, L. (Contributor)
2015

The 13th International ISRM Congress 2015 International Congress on Rock Mechanics, Montreal, 10.-13.5.2016, Canada
Uotinen, L. (Contributor)
2015

KTH Royal Institute of Technology
Uotinen, L. (Visiting researcher)
2014

University
Uotinen, L. (Student)
2014

University (External organisation)
Uotinen, L. (Chair)
2012

Research outputs

Experimental and numerical characterization of hydro-mechanical properties of rock fractures : The effect of the sample size on roughness and hydraulic aperture
Torkan, M., Uotinen, L., Baghbanan, A. & Rinne, M., Feb 2025, In: International Journal of Rock Mechanics and Mining Sciences. 186, 18 p., 106009.

Numerical study of scale effect on fluid flow through a rough fracture
Torkan, M., Janiszewski, M., Uotinen, L., Rinne, M. & Baghbanan, A., 17 Sept 2024, *New Challenges in Rock Mechanics and Rock Engineering - Proceedings of the ISRM Rock Mechanics Symposium, EUROCK 2024.* Tomás, R., Cano, M., Riquelme, A., Pastor, J. L., Benavente, D. & Ordóñez, S. (eds.). CRC Press, p. 500-505 6 p. (New Challenges in Rock Mechanics and Rock Engineering - Proceedings of the ISRM Rock Mechanics Symposium, EUROCK 2024).

High-resolution photogrammetry to measure physical aperture of two separated rock fracture surfaces
Torkan, M., Janiszewski, M., Uotinen, L., Baghbanan, A. & Rinne, M., Aug 2024, In: Journal of Rock Mechanics and Geotechnical Engineering. 16, 8, p. 2922-2934 13 p.

Improvements in Rock Mass Description for Stope Design by Geophysical and Geochemical Methods
Rinne, M., Janiszewski, M., Pontow, S., Uotinen, L., Kiuru, R., Kangas, L., Laine, I. & Leveinen, J., Feb 2024, In: Applied Sciences. 14, 3, 16 p., 957.

Tunnel face videogrammetry for low-cost digitization and discontinuity set orientation measurements
Janiszewski, M., Torkan, M., Uotinen, L., Javed, H. & Rinne, M., 2024, *New Challenges in Rock Mechanics and Rock Engineering - Proceedings of the ISRM Rock Mechanics Symposium, EUROCK 2024.* Tomás, R., Cano, M., Riquelme, A., Pastor, J. L., Benavente, D. & Ordóñez, S. (eds.). CRC Press, p. 872-878 7 p. (New Challenges in Rock Mechanics and Rock Engineering - Proceedings of the ISRM Rock Mechanics Symposium, EUROCK 2024).

Influence of contact shape and distribution on fluid flow through a fracture
Torkan, M., Hosseini Khorasgani, A., Uotinen, L., Baghbanan, A. & Rinne, M., 9 Oct 2023, *Proceedings of the ISRM 15th International Congress on Rock Mechanics and Rock Engineering & 72nd Geomechanics Colloquium – Challenges in*

Rock Mechanics and Rock Engineering, Salzburg, Austria, October 9-14, 2023. Austrian Society for Geomechanics, p. 1823-1828 6 p.

Interactive and parametrized exercises in engineering education at Aalto University
Uotinen, L., Janiszewski, M. & Rinne, M., 6 Sept 2023.

Rapid photogrammetric method for rock mass characterization in underground excavations
Janiszewski, M., Prittinen, M., Uotinen, L., Torkan, M. & Rinne, M., 24 May 2023, *The IV Nordic Symposium on Rock Mechanics and Rock Engineering: Proceedings of the NROCK 2023.* Sigursteinsson, H. & Ingimarsson, A. K. (eds.). Reykjavik, Iceland: Jarðtæknifélag Íslands, p. 213-221 9 p.

Effect of anisotropy of fracture surface on fluid flow
Torkan, M., Hosseini Khorasgani , A., Uotinen, L., Baghbanan, A. & Rinne, M., 10 Jan 2023, In: IOP Conference Series: Earth and Environmental Science. 1124, 1, 8 p., 012036.

Evaluation of surface roughness of rock-like joints using close range photogrammetry method
Momeni, A. H., Torkan, M., Azhari, A., Uotinen, L. & Baghbanan, A., 10 Jan 2023, In: IOP Conference Series: Earth and Environmental Science. 1124, 1, 8 p., 012062.

Method to obtain 3D point clouds of tunnels using smartphone LiDAR and comparison to photogrammetry
Torkan, M., Janiszewski, M., Uotinen, L. & Rinne, M., 10 Jan 2023, In: IOP Conference Series: Earth and Environmental Science. 1124, 1, 012016.

Rapid tunnel scanning using a 360-degree camera and SfM photogrammetry
Janiszewski, M., Prittinen, M., Torkan, M. & Uotinen, L., 10 Jan 2023, In: IOP Conference Series: Earth and Environmental Science. 1124, 1, 8 p., 012010.

Virtual reality learning system for remote rock mass mapping
Janiszewski, M., Zhang, X., Uotinen, L. & Rinne, M., 10 Jan 2023, In: IOP Conference Series: Earth and Environmental Science. 1124, 1, 6 p., 012079.

Virtual learning environments for rock engineering education and training - a guideline for development, examples, and lessons learned
Janiszewski, M., Uotinen, L., Torkan, M. & Rinne, M., 2023, *Proceedings of the ISRM 15th International Congress on Rock Mechanics and Rock Engineering & 72nd Geomechanics Colloquium – Challenges in Rock Mechanics and Rock Engineering, Salzburg, Austria, October 9-14, 2023.* Austrian Society for Geomechanics, 6 p.

Rapid Photogrammetry with a 360-Degree Camera for Tunnel Mapping
Janiszewski, M., Torkan, M., Uotinen, L. & Rinne, M., 31 Oct 2022, In: Remote Sensing. 14, 21, 20 p., 5494.

Photogrammetric Method to Determine Physical Aperture and Roughness of a Rock Fracture
Torkan, M., Janiszewski, M., Uotinen, L., Baghbanan, A. & Rinne, M., 1 Jun 2022, In: Sensors (Basel, Switzerland). 22, 11 , 25 p., 4165.

Method for estimating rockfall failure probability using photogrammetry
Uotinen, L., Janiszewski, M., Mishra, R., Munukka, H., Szydlowska, M., Martinelli, D. & Dabove, P., 6 Sept 2021, In: IOP Conference Series: Earth and Environmental Science. 833, 1, 8 p., 012063.

Monitoring of rock stress change using instrumented rebar rock bolts
Mai, W., Janiszewski, M., Uotinen, L., Mishra, R. & Rinne, M., 6 Sept 2021, In: IOP Conference Series: Earth and Environmental Science. 833, 1, 9 p., 012141.

Photogrammetry based characterization of hydro-mechanical properties of a rock fracture
Torkan, M., Uotinen, L., Nieminen, V. & Rinne, M., 6 Sept 2021, In: IOP Conference Series: Earth and Environmental Science. 833, 1, 9 p., 012019.

Photogrammetric prediction of rock fracture properties and validation with metric shear tests
Uotinen, L., Torkan, M., Baghbanan, A., Hernández, E. C. & Rinne, M., Jul 2021, In: Geosciences. 11, 7, 31 p., 293.

A Bayesian network approach for geotechnical risk assessment in underground mines
Mishra, R., Uotinen, L. & Rinne, M., Jun 2021, In: Journal of the South African Institute of Mining and Metallurgy. 121, 6, p. 287-294 8 p.

Visualization of 3D rock mass properties in underground tunnels using extended reality
Janiszewski, M., Uotinen, L., Szydlowska, M., Munukka, H. & Dong, J., 23 Apr 2021, In: IOP Conference Series: Earth and Environmental Science. 703, 1, 6 p., 012046.

Characterization of hydro-mechanical properties of rock fractures using steady state flow tests
Uotinen, L., Torkan, M., Janiszewski, M., Baghbanan, A., Nieminen, V. & Rinne, M., 13 Nov 2020, *ISRM International Symposium - EUROCK 2020.* Li, C. C., Odegaard, H., Hoien, A. H. & Macias, J. (eds.). Norsk Betongforening, 8 p.

Digitisation of hard rock tunnel for remote fracture mapping and virtual training environment
Janiszewski, M., Uotinen, L., Baghbanan, A. & Rinne, M., Nov 2020, *ISRM International Symposium - EUROCK 2020: International Society for Rock Mechanics and Rock Engineering Norwegian Group for Rock Mechanics* . Li, C. C., Ødegaard, H., Høien, A. H. & Macias, J. (eds.). Norsk Betongforening, 8 p.

Virtual Reality Learning Environments for Rock Engineering, Geology and Mining Education
Janiszewski, M., Uotinen, L., Merkel, J., Leveinen, J. & Rinne, M., 22 Sept 2020, *54th U.S. Rock Mechanics/Geomechanics Symposium, 28 June - 1 July: physical event cancelled.* American Rock Mechanics Association , 7 p. ARMA-2020-1101

Accuracy of GPR based 3D fracture surface geometry interpretation
Kiuru, R., Kantia, P. & Uotinen, L., 12 Dec 2019.

Kalliorakenteiden digitointi valokuvamittauksen avulla
Uotinen, L., 23 Oct 2019, In: Geofoor. 49, p. 22-23 2 p.

VR learning environments for rock engineering and mining education
Janiszewski, M., Uotinen, L., Merkel, J., Leveinen, J. & Rinne, M., 18 Oct 2019, p. 13.

Photogrammetry for recording rock surface geometry and fracture characterization
Uotinen, L., Janiszewski, M., Baghbanan, A., Caballero Hernandez, E., Oraskari, J., Munukka, H., Szydlowska, M. & Rinne, M., 17 Sept 2019, *Proceedings of the 14th International Congress on Rock Mechanics and Rock Engineering (ISRM 2019), Foz do Iguassu, Brazil, 13-18 September 2019: Rock Mechanics for Natural Resources and Infrastructure Development - Full Papers.* da Fontoura, S. A. B., Rocca, R. J. & Pavón Mendoza, J. F. (eds.). CRC Press, p. 461-468 8 p. (Proceedings in Earth and geosciences; vol. 6).

Combining expert opinion and instrumentation data using Bayesian networks to carry out stope collapse risk assessment
Mishra, R., Kiuru, R., Uotinen, L., Janiszewski, M. & Rinne, M., 9 Apr 2019, *Mining geomechanical risk 2019 : Proceedings of the First International Conference on Mining Geomechanical Risk*. Perth: Australian Centre for Geomechanics, p. 85-96 12 p.

Effective modelling of borehole solar thermal energy storage systems in high latitudes
Janiszewski, M., Siren, T., Uotinen, L. K. T., Oosterbaan, H. & Rinne, M., 10 Dec 2018, In: Geomechanics and Engineering. 16, 5, p. 503-512 10 p.

In Situ Experiment and Numerical Model Validation of a Borehole Heat Exchanger in Shallow Hard Crystalline Rock
Janiszewski, M., Caballero Hernandez, E., Siren, T., Uotinen, L., Kukkonen, I. & Rinne, M., 17 Apr 2018, In: Energies. 11, 4, 21 p., 963.

Prediction of stress-driven rock mass damage in spent nuclear fuel repositories in hard crystalline rock and in deep underground mines
Uotinen, L., 2018, Aalto University. 164 p.

Numerical predictions for underground thermal energy storage experiment in the Otaniemi research tunnel
Janiszewski, M., Caballero Hernandez, E., Siren, T., Uotinen, L. & Rinne, M., 11 Oct 2017, *3rd Nordic Rock Mechanics Symposium NRMS 2017 : Symposium Proceedings.* Johansson, E. & V. R. (eds.). Suomen rakennusinsinöörien liitto RIL, p. 77-85 9 p. (RIL / Suomen rakennusinsinöörien liitto).

Modelling of Borehole Solar Energy Storage Concept in High Latitudes
Siren, T., Janiszewski, M., Uotinen, L. K. T. & Oosterbaan, H., 11 May 2017, *2017 YSRM Young Scholars' Symposium on Rock Mechanics: Proceedings of.* Korea: Korean Society for Rock Mechanics and Rock Engineering, p. 369-372 4 p.

Elastoplastic Modelling of an In Situ Concrete Spalling Experiment using the Ottosen Failure Criterion
Uotinen, L. & Siren, T., 31 Jan 2017, In: Journal of Engineering. 2017, 17 p., 4723017.

A method to downscale joint surface roughness and to create replica series using 3D printed molds
Uotinen, L., Korpi, E., Hartikainen, A., Yorke, R., Antikainen, J., Johansson, F. & Rinne, M., 2017, *ISRM 13th International Congress on Rock Mechanics, Montreal, May 10-13, 2015.* Canadian Institute of Mining, Metallurgy and Petroleum, 11 p.

Bayesian Network Approach for Geotechnical Risk Assessment in Underground Mines
Mishra, R., Uotinen, L. K. T. & Rinne, M., 2017, (Submitted) In: Safety Science.

Geotechnical risk management concept for intelligent deep mines
Mishra, R., Janiszewski, M., Uotinen, L., Szydlowska, M., Siren, T. & Rinne, M., 2017, *Symposium of the International Society for Rock Mechanics.* Elsevier, Vol. 191. p. 361-368 (Procedia engineering; vol. 191).

Numerical thermal back-calculation of the Kerava Solar Village underground thermal energy storage
Oosterbaan, H., Janiszewski, M., Uotinen, L., Siren, T. & Rinne, M., 2017, In: Procedia Engineering. 191, p. 352-360 8 p.

Pull Experiment to Validate Photogrammetrically Predicted Friction Angle of Rock Discontinuities
Dzugala, M., Sirkiä, J., Uotinen, L. & Rinne, M., 2017, *Symposium of the International Society for Rock Mechanics.* Elsevier, p. 378-385 8 p. (Procedia engineering; vol. 191).

Real-Time Risk Assessment and Ground Support Optimisation in Underground Mines
Mishra, R., Ritala, F., Janiszewski, M., Uotinen, L. & Siren, T., 14 Oct 2016, *Proceedings of the Eighth International Symposium on Ground Support in Mining and Underground Construction: Ground Support 2016.* Nordlund, E., Jones, T. H. & Eitzenberger, A. (eds.). Luleå: Luleå tekniska universitet, 12 p. 209

Using Observational Method to Manage Safety Aspects of Remedial Grouting of Concrete Dam Foundations
Spross, J., Johansson, F., Uotinen, L. K. T. & Rafi, J. Y., Oct 2016, In: Geotechnical and Geological Engineering. 34, 5, p. 1613–1630 18 p.

Feasibility of underground seasonal storage of solar heat in Finland
Janiszewski, M., Kopaly, A., Honkonen, M., Kukkonen, I., Uotinen, L., Siren, T. & Rinne, M., 29 Sept 2016, *International Conference on Geo-mechanics, Geo-energy and Geo-resources: Conference Proceedings.* PG, R. & Jian, Z. (eds.). Melbourne, Australia: Monash University, p. 959-965 7 p. 236

Photogrammetric calculation of JRC for rock slope support design
Sirkiä, J., Kallio, P., Iakovlev, D. & Uotinen, L., 14 Sept 2016, *Proceedings of the Eighth International Symposium on Ground Support in Mining and Underground Construction: Ground Support 2016.* Nordlund, E., Jones, T. H. & Eitzenberger, A. (eds.). Luleå: Luleå tekniska universitet, 13 p.

Determination of joint mechanical parameters for stability analysis in low stress open pit mines
Iakovlev, D., Sirkiä, J., Kallio, P. & Uotinen, L., 12 May 2016, *7th International Symposium on In-Situ Rock Stress: Symposium Proceedings.* Johansson, E. & Raasakka, V. (eds.). Tampere, Finland: Suomen rakennusinsinöörien liitto RIL , p. 625-634 10 p. (RIL).

Stress State Change Monitoring Using Displacement Change Measurements
Ritala, F., Siren, T. & Uotinen, L., 12 May 2016, *7th International Symposium on In-Situ Rock Stress: Symposium Proceedings.* Johansson, E. & Raasakka, V. (eds.). Tampere, Finland: Suomen rakennusinsinöörien liitto RIL, 9 p. (RIL).

Thermally Induced Rock Stress Increment And Rock Reinforcement Response
Ström, J., Hakala, M., Suikkanen, J., Siren, T., Uotinen, L. & Nuijten, G., 10 May 2016, *7th International Symposium on In-Situ Rock Stress: Symposium proceedings* . Johansson, E. & Raasakka, V. (eds.). Tampere, Finland: Suomen rakennusinsinöörien liitto RIL, 10 p. (RIL).

Fracture Mechanics Modelling of an In Situ Concrete Spalling Experiment
Siren, T., Uotinen, L., Rinne, M. & Shen, B., 2015, In: Rock Mechanics and Rock Engineering. 48, 4, p. 1423-1438

Real time stress change estimation using strain measurements
Kodeda, S., Ritala, F., Siren, T. & Uotinen, L., 2015, *Eurock 2015 & 64th Geomechanics Colloquium, Salzburg, Austria, October 7-10, 2015.* Schubert, W. & Kluckner, A. (eds.). Graz: Austrian Society for Geomechanics, p. 1071-1076

Thermally Induced Rock Stress Increment and Rock Reinforcement Response
Hakala, M., Ström, J., Nuijten, G., Uotinen, L., Siren, T. & Suikkanen, J., 15 Aug 2014, Posiva Oy, 72 p.

Improving teaching methods of rock mass classification parameters
Barbens, P. T., Uotinen, L., Toivanen, T.-L. & Edelbro, C., 2014, *Eurock 2014. Rock Engineering and Rock Mechanics: Structures in and on Rock Masses, Vigo, Spain 26-28 May 2014.* Alejano, L. R., Perucho, A., Olalla, C. & Jimenez, R. (eds.). Leiden: CRC Press, p. 451-455

Kalliotekniikan kerho KTK
Hurskainen, P. & Uotinen, L., 2014, In: MATERIA. 3, p. 70

Modified yield-line theory approach to determine spayed concrete flexural capacity
Uotinen, L., Suikkanen, J. & Siren, T., 2014, *7th International Symposium on Sprayed Concrete, Sandefjord, Norway, 16.-19. June 2014: Modern Use of Wet Mix Sprayed Concrete for Underground Support* . Beck, T., Woldmo, O. & Engen, S. (eds.). Norwegian Society of Graduate Technical and Scientific Professionals (Tekna), p. 387-400

Design of sprayed concrete as hard rock reinforcement using yield-line theory
Uotinen, L. K. T., Salo, O. & Rinne, M., 2013, *Rock Characterisation, Modelling and Engineering Design Methods - Proceedings of the 3rd ISRM SINOROCK 2013 Symposium.* CRC Press, p. 817-822 6 p.

In-situ experiment concerning thermally induced spalling of circular shotcreted shafts in deep crystalline rock
Uotinen, L., Siren, T., Martinelle, D. & Hakala, M., 2013, *World Tunnel Congress 2013, Switzerland, May 31- June 7, 2013.* Anagnostou, G. & Ehrbar, H. (eds.). London: Taylor & Francis, p. 808-815

Semiautomatic Characterization of Rock Masses Using Photogrammetry, 3D Printing Technology and Ground Penetrating Radar
Uotinen, L., Song, Z., Hedström, O., Huuskonen-Snicker, E., Toivanen, T.-L., Palmén, J. & Hokkanen, T., 2013, p. 108-108. 1 p.

Rock engineering design process in ONKALO rock characterisation facility
Uotinen, L., Nuijten, G., Martinelli, D., Lehmusjärvi, R. & Rinne, M., 30 May 2012, *Rock Engineering and Technology for Sustainable Underground Construction EUROCK 2012, Stockholm 28-30.5.2012.* Stockholm: International Society for Rock Mechanics (ISRM), 11 p.

Rock mechanical modelling of Keilaniemi metro station of Länsimetro in Finland
Martinelli, D., Ström, J., Westerlund, G., Uotinen, L. & Nuijten, G., 2012, *Rock Engineering and Technology for Sustainable Underground Construction EUROCK 2012, Stockholm 28-30.5.2012.* Stockholm: International Society for Rock Mechanics (ISRM), 11 p.

Assessment of the Potential for Rock Spalling in the Technical Rooms of the ONKALO: Work Report 2011-35
Uotinen, L., Siren, T. & Martinelli, D., 10 Aug 2011, Posiva Oy, 40 p.

Design of shotcrete rock reinforcement in hard rock according to Eurocode
Uotinen, L., 6 Jun 2011, *Seminar on Geoengineering.* 21 p.

Eurocodes in Hard Rock Engineering in Finland
Uotinen, L., Nuijten, G., Siren, T., Stöm, J., Hakala, M. & Rinne, M., 22 May 2011, *ITA-AITES World Tunnel Congress, Helsinki 20-26.5.2011.* Helsinki: Finnish Tunnelling Association, p. 126-127

Numerical spalling assessment methods in crystalline rock during the design of ONKALO rock characterization facility
Siren, T., Martinelli, D., Uotinen, L., Nuijten, G. & Lehmusjärvi, R., 22 May 2010, *World Tunnel Congress 2011: Underground spaces in the service of a sustainable society.* 8 p.

Spalling prediction methods in high stress conditions
Siren, T., Uotinen, L., Ström, J., Lehmusjärvi, R. & Rinne, M., 2 Oct 2009, *Get Underground 2009: Underground Space Seminar.* 11 p.

Stochastically Determined Safety of Underground Structures According to Eurocode
Uotinen, L., Siren, T. & Lehmusjärvi, R., 2 Oct 2009, *Get Underground 2009: Underground Space Seminar.* 10 p.

Press/Media

Australia Patent: Aalto University Foundation sr Files Application for 'Method, system, and computer program product for a real-time estimation of risk in an excavation'
Janiszewski, M. & Uotinen, L.
03/02/2023
1 item of Media coverage

Australia Patent: Aalto University Foundation sr Files Application for 'Method, system and computer program product for real-time monitoring of stress changes in an excavation'
Uotinen, L.
03/02/2023
1 item of Media coverage

Researcher from Aalto University Details Findings in Applied Sciences (Improvements in Rock Mass Description for Stope Design by Geophysical and Geochemical Methods)
Janiszewski, M., Rinne, M., Uotinen, L., Kiuru, R. & Laine, I.
08/02/2024
1 item of Media coverage

Study Findings from Aalto University Broaden Understanding of Remote Sensing (Rapid Photogrammetry with a 360-Degree Camera for Tunnel Mapping)
Janiszewski, M., Rinne, M. & Uotinen, L.
29/11/2022
1 item of Media coverage

Suomalaistutkija sai merkittävän palkinnon – tutkii kivien putoamista kallioleikkauksissa
Uotinen, L.

30/09/2021 → 01/10/2021
1 item of Media coverage, 1 Media contribution