

Debasis Mohapatra
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Mineral Based Materials and Mechanics
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Artistic and research interests

Research Interests

- Offshore geotechnical engineering
- Constitutive modelling in soil
- Geotechnical earthquake engineering
- Soil-structure interaction
- Multiscale and multi-physics modeling in geotechnical Engineering
- Advanced discretization techniques (Smoothed-FEM, meshless method, Adaptive FEM, PolyFEM etc.)
- Large deformation analysis in geotechnical engineering

Employment

Contingent Worker

Visitor (Faculty)
Department of Civil Engineering
Aalto University
29 May 2024 → present

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Research outputs

Numerical simulation of in-situ free fall cone penetrometer tests using the material point method

Mohapatra, D., Mohammadi Hasanbarough, S., Saresma, M., Virtasalo, J. & Sołowski, W. T., 12 Apr 2024, *UK Association for Computational Mechanics*. Coombs, W. M. (ed.). 2024 ed. Durham University, p. 157-160 4 p.

Numerical Simulation of a Laboratory-Scale Free Fall Cone Penetrometer Test in Marine Clay with the Material Point Method

Mohapatra, D., Saresma, M., Virtasalo, J. & Sołowski, W. T., 23 Nov 2023, *VIII International Conference on Particle-Based Methods (PARTICLES 2023)*. Scipedia, 10 p.

In situ free-fall cone penetrometer (FF-CPT) and laboratory fall cone characterisation of soft marine sediments in the Gulf of Finland, Baltic Sea

Saresma, M., Virtasalo, J., Li, Z., Mohapatra, D. & Sołowski, W. T., Sept 2023, *Proceedings of the 9th International SUT Offshore Site Investigation and Geotechnics Conference: Innovative geotechnologies for energy transition*. Society of Underwater Technology, Vol. 3. p. 1911-1918 8 p. (Offshore site investigation and geotechnics).

Replication of fall cone test in marine clay with a Generalized Interpolation Material Point Method simulation

Mohapatra, D., Li, Z., Saresma, M., Virtasalo, J. & Sołowski, W., Jul 2023, *10th European Conference on Numerical Methods in Geotechnical Engineering*. International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), 6 p.

Geological, geophysical and mechanical identification of marine deposits from the Gulf of Finland

Li, Z., Mohapatra, D., Sołowski, W. T., Saresma, M., Virtasalo, J. & Khalili, R., 2023, *Proceedings of the 9th International SUT Offshore Site Investigation and Geotechnics Conference : Innovative Geotechnologies for Energy Transition*. London: Society of Underwater Technology, Vol. 2. p. 874-881 8 p. (Offshore site investigation and geotechnics).

Homogenization based kinematic limit analysis for finding the stability of an embankment over soft clay reinforced with granular columns

Mohapatra, D. & Kumar, J., Feb 2022, In: Computers and Geotechnics. 142, 14 p., 104562.

Kinematic limit analysis for clays with anisotropy and different strengths in compression and tension

Mohapatra, D. & Kumar, J., Oct 2020, In: Computers and Geotechnics. 126, 103713.

Bearing capacity of embedded foundations using quasi-kinematic limit analysis

Mohapatra, D. & Kumar, J., Jan 2020, In: Computers and Geotechnics. 117, 103275.

An Adaptive-Based Finite Element Limit Analysis Approach for Geo-mechanics Problems

Mohapatra, D., Rahaman, O. & Kumar, J., 2020, *Geotechnical Characterization and Modelling*. Springer, (Lecture notes in civil engineering; vol. 85).

Bearing Capacity of Piles in Non-homogeneous Clay Using Conic Programming

Rahaman, O., Mohapatra, D. & Kumar, J., 2020, *Geotechnical Characterization and Modelling*. Springer, (Lecture notes in civil engineering; no. 85).

Novel Numerical Procedures for Limit Analysis: Implementation to Planar, Axisymmetric and Three-Dimensional Geomechanics Stability Problems

Mohapatra, D., 2020

Smoothed finite element approach for kinematic limit analysis of cohesive frictional materials

Mohapatra, D. & Kumar, J., May 2019, In: European Journal of Mechanics A: Solids. 76, p. 328-345

Collapse loads for rectangular foundations by three-dimensional upper bound limit analysis using radial point interpolation method

Mohapatra, D. & Kumar, J., 10 Feb 2019, In: International Journal for Numerical and Analytical Methods in Geomechanics. 43, 2, p. 641-660

Upper-Bound Finite-Element Limit Analysis of Axisymmetric Problems for Mohr-Coulomb Materials Using Semidefinite Programming

Mohapatra, D. & Kumar, J., Jul 2018, In: Journal of Engineering Mechanics. 144, 7

Closure to "Lower-Bound Finite Elements Limit Analysis for Hoek-Brown Materials Using Semidefinite Programming" by Jyant Kumar and Debasis Mohapatra

Kumar, J. & Mohapatra, D., 2018, In: Journal of Engineering Mechanics. 4 p.

Lower-Bound Finite Elements Limit Analysis for Hoek-Brown Materials Using Semidefinite Programming

Mohapatra, D. & Kumar, J., 2017, In: Journal of Engineering Mechanics. 143, 9

A Parametric Investigation Into Modeling of Unbounded Domain Using Perfectly Matched Layer

Mohapatra, D., 2014

Projects

GEOMEASURE/Solowski: Foundations for green offshore energy production in Finland: from marine investigations to the numerical estimation of undrained shear strength of the seabed deposit layers under cycling loading

Solowski, W. (Principal investigator), Li, Z. (Project Member), Mohapatra, D. (Project Member), Mohammadi Hasanbarough, S. (Project Member), Gupta, A. (Project Member), Khalilii, R. (Project Member), Ruan, C. (Project Member) & Prasetyo, B. (Project Member)

EU The Recovery and Resilience Facility (RRF)

01/01/2022 → 31/12/2024

