PERSONAL INFORMATION

Mijo Nikolić

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Sex male | Date of birth 02/01/1988 | Nationality Croatian

WORK EXPERIENCE

2019 - Assistant Professor at Department of Mechanics

University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Matice hrvatske 15, 21000 Split, Croatia

2016 - 2018 Postdoctoral researcher at Department of Geotechnics

University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Matice hrvatske 15, 21000 Split, Croatia

2015 - 2016 Postdoctoral researcher at UTC Compiègne

Université de Technologie de Compiègne (UTC), Laboratoire Roberval de Mécanique, Alliance Sorbonne Université

2012 – 2015 Technical assistant at Department of Geotechnics

University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Matice hrvatske 15, 21000 Split, Croatia

2011 / 2012 Teaching assistant at Department of Geotechnics

University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Matice hrvatske 15, 21000 Split, Croatia

EDUCATION AND TRAINING

2012 - 2015 PhD in mechanics and civil engineering

Joint doctorate:

École Normale Supérieure de Cachan, Laboratoire de Mécanique et Technologie, 61 Avenue du president Wilson, 94320 Cachan, France

University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Matice hrvatske 15, 21000 Split, Croatia

- Development of novel numerical methods and models, programming, writing the scientific articles
- Thesis subject: Rock mechanics, failure phenomena with pre-existing cracks and internal fluid flow through cracks

2009 - 2011 Master of science in civil engineering

University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Matice hrvatske 15, 21000 Split, Croatia

2006 - 2009 Bachelor of science in civil engineering

University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Matice hrvatske 15, 21000 Split, Croatia

2002 - 2006

High school

Mathematics-informatics high school, Matice hrvatske 11, 21000 Split, Croatia

PERSONAL SKILLS

Mother tongue(s): Croatian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1

Communication skills

Gained through:

- Team work and collaboration with scientists in international framework (ENS Paris Saclay/ex. Cachan, UT Compiegne, TU Braunschweig)
- Presentations at international conferences
- Invited lecture at UT Compiegne
- Teaching experience at University of Split, Croatia
- Giving the computer program courses related to structural engineering to the undergraduate students

Technical and job-related skills

- **Data science skills**: I am the principal investigator of FracID project that deals with data science models that we develop in Matlab and Python
- Machine learning models in Python, neural networks
- AI (deep neural network models, Keras and Tensor Flow), Computer vision using Yolo
- Knowledge of supervised and unsupervised data science models
- Supervised learning models: Regression (linear and nonlinear regression), Trees, Random forrest algorithms, Classifiers, Support Vector Machines, Recommender systems models
- Unsupervised clustering models
- Bayes statistics based models
- Numerical transformation of features, data transformations as preparation for learning, transforming data into features, encoding of categorical variables
- Python libraries for data science, *pandas, numpy*
- Expert data visualization in python
- Expert knowledge in mathematics of data science (machine learning, regression, neural networks) – gradients, back propagation
- Expert knowledge in statistics and using statistical models
- Experience in fitting the proper parameters for data science models
- Cleaning and tidying data, preparing data (normalization etc) for machine learning and AI models
- Basics of SQL

- **Civil Engineering and research skills:**
- Research work in the field of computational mechanics and geotechnics (continuum and discontinuum mechanics, rock and soil mechanics)
- Professional work in the field of geotechnics: shallow foundations, deep foundations, excavation protection, use of Plaxis software, saturated and unsaturated soil mechanics, experience in dozens of professional projects in geotechnical engineering
- Developing novel numerical methods and models
- Development and applications: Finite Element Method, Embedded discontinuity Finite Element Method, Lattice Element Method, Extended Finite Element Method, Discrete Element Method
- Modelling structures with linear and non-linear behaviour
- Programming in Fortran, C, C++, Python, Matlab
- Work with commercial computer programs for structural engineering and geotechnics (Scia engineer, Plaxis)

Computer skills
- Advanced in Windows and Linux OS
- AUTOCAD

ADDITIONAL INFORMATION

Honours and awards
- 2015 Award for the best PhD thesis by CEACM – Central European Association for Computational Mechanics
- 2015 Nominee of the ECCOMAS PhD thesis award
- 2014/15 École Normale Supérieure de Cachan scholarship for funding doctoral studies
- 2013/14 French Government through Campus France scholarship for funding doctoral studies
- 2013. Erasmus scholarship for funding doctoral studies
- 2009.-2011. City of Split, Scholarship for funding master studies
- 2006.-2009. Croatian Ministry of Science, Education and Sports, Scholarship for funding bachelor studies

Specialization
- March 2014 – May 2015, TU Braunschweig, Germany
- November 2014 – January 2015, UT Compiègne, France

Work on scientific projects
- 2021-2025: HRZZ-UIP-2020-02-6693 – Principal investigator: Parameter estimation framework for fracture propagation problems under extreme mechanical loads (FracID)
- 2017-2023: HRZZ-UIP-2017-05-3429 – Associate researcher: Experimental and numerical investigations of mechanisms in unsaturated geomaterials (UNSAT1)
- 2015-2019: HRZZ-IP-2014-09-2319 - Associate researcher: Development of numerical models for reinforced-concrete and stone masonry structures under seismic loading based on discrete cracks (SeismoNuMod)
- 2016-2017: OLLA – Overhead Line Lifespan Assessment

Journal papers

- S Dobrilla, M Lunardelli, M Nikolić, D Lowke, B Rosić, Bayesian inference of mesoscale mechanical properties of mortar using experimental data from a double shear test, Computer Methods in Applied Mechanics and Engineering, 409, 115964, 2023
- M Nikolić, Discrete element model for the failure analysis of partially saturated porous media with propagating cracks represented with embedded strong discontinuities, Computer Methods in Applied Mechanics and Engineering, 390, 114482, 2022
- M Nikolić, E Karavelić, A Ibrahimbegovic, P Miščević, Lattice element models and their peculiarities, Archives of Computational Methods in Engineering 25 (3), 753-784, 2018
- E Karavelić, M Nikolić, A Ibrahimbegovic, A Kurtović, Concrete meso-scale model with full set of 3D failure modes with random distribution of aggregate and cement phase. Part I: Formulation and numerical implementation, Computer Methods in Applied Mechanics and Engineering 344, 1051-1072, 2019
- ZH Rizvi, M Nikolić, F Wuttke, Lattice element method for simulations of failure in bio-cemented sands, Granular Matter 21 (2), 18, 2019
- J Čarija, M Nikolić, A Ibrahimbegovic, Ž Nikolić, Discrete softening-damage model for fracture process representation with embedded strong discontinuities, Engineering Fracture Mechanics, 107211, 2020
- A Raič, M Nikolić, N Štambuk Cvitanović, M Galić, Numerical simulation of saturated and unsaturated consolidation behaviour of marl residual soil, International Journal for Engineering Modelling 34, 31-47, 2021
- M Nikolić, XN Do, A Ibrahimbegovic, Ž Nikolić, Crack propagation in dynamics by embedded strong discontinuity approach: Enhanced solid versus discrete lattice model, Computer Methods in Applied Mechanics and Engineering 340, 480-499, 2018
- Nikolic M., Ibrahimbegovic A., Miscevic P. Brittle and ductile failure of rocks: embedded discontinuity approach for representing mode I and mode II failure mechanisms. International Journal for Numerical Methods in Engineering, 102, 1507-1526, 2015
- Nikolic M., Ibrahimbegovic A. Rock mechanics model capable of representing initial heterogeneities and full set of 3D failure mechanisms. Computer Methods in Applied Mechanics and Engineering, 290, 209-229, 2015
- Bui V.N., Ngo V.M., Nikolic M., Brancherie D., Ibrahimbegovic A. Enriched Timoshenko beam finite element for modeling bending and shear failure of reinforced concrete frames, Computers and Structures, 143, 9-18, 2014
- Nikolic M., Ibrahimbegovic A., Miscevic P. Discrete element model for the analysis of fluid-saturated fractured poro-plastic medium based on sharp crack representation with embedded strong discontinuities, Computer Methods in Applied Mechanics and Engineering, 298, 407-427, 2016
- Štambuk-Cvitanović N., Nikolic M., Ibrahimbegovic A. Influence of specimen shape deviations on uniaxial compressive strength of limestone and similar rocks, Int. Journal for Rock Mechanics and Mining Sciences, 80, 357-372, 2015
- Nikolic M., Roje-Bonacci T., Ibrahimbegovic A. Overview of the numerical methods for the modelling of rock mechanics problems. Technical Gazette, 23, 627-637, 2016

Book Chapter

- Nikolic M., Ibrahimbegovic A., Miscevic P. Modelling of fluid-structure interaction for internal fluid flow in cracks by using embedded strong discontinuities. In (ed. A. Ibrahimbegovic), Computational Methods for Solids and Fluids: Multiscale Analysis, Probability Aspects and Model Reduction, Springer, 315-341, 2016

Invited lecture

- UT Compiegne, France, September 2015.: Rock mechanics, failure phenomena with pre-existing cracks and internal fluid flow through cracks
- Christian-Albrechts-Universität zu Kiel, September 2018.: Lattice Element Method and its applications, https://www.geotechnics.ifg.uni-kiel.de/en/news/september-2018-geomechanics-and-geotechnics-welcomed-and-thanked-dr-mijo-nikolic-invited-lecturer-from-universtiy-of-split-croatia