Curriculum vitae

Name: Gregor Kosec

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ResearchGate Profile: https://www.researchgate.net/profile/Gregor_Kosec

Google Scholar Profile: http://scholar.google.si/citations?user=Obn5FmoAAAAJs

Education

- Ph.D.: University of Nova Gorica, Graduate School (2011) - Thesis on "Local Meshless Method For Multi-Phase Thermo-Fluid Problems"
- B.Sc.: University of Ljubljana, Faculty of Mathematics and Physics (2006)

Employment

- 2020-Present: Head of the Parallel and Distributed Systems Laboratory, Jožef Stefan Institute
- 2015-2020: Research Associate, Parallel and Distributed Systems Laboratory, Jožef Stefan Institute
- 2011-2015: Postdoctoral Researcher, Parallel and Distributed Systems Laboratory, Jožef Stefan Institute
- 2006-2011: Junior Researcher/Teaching Assistant, Laboratory for Multi-Phase Processes, University of Nova Gorica

Research Interests/Experience

- Adaptive meshless methods for solving partial differential equations
- Mathematical modelling
- Generic computer implementation of numerical algorithms

Visiting Researcher Positions

- Institut Jean Lamour, Ecole des Mines de Nancy, France (2010, 2011)
- Faculty of Mechanical Engineering, University of Podgorica, Montenegro (2010)
- FAST, Heat & Mass Transfer and Fluid Flow group, Orsay, France (2009)

Awards

- State award, The Puh Certificate of Recognition (2017)
- Emerald's awards for excellence, Engineering Outstanding Doctoral Research (2014)
- Emerald's awards for excellence, Outstanding paper on "Solution of a low Prandtl number natural convection benchmark by a local meshless method" (2013)
- Slovene human resources development and scholarship fund, Reward for exceptional contribution to sustainable development (2010)
- Emerald's awards for excellence, Highly recommended paper on "Solution of thermo-fluid problems by collocation with local pressure correction" (2009)
- World Federation of Scientists, National Scholarship (2009)

Leadership experiences

- Head of the Laboratory and programme group
    - 2020-Present: Head of the Parallel and Distributed Systems Laboratory at the Jožef Stefan Institute (3.6 FTE/year)
    - Oversees a team comprising 10-13 full-time and 2 part-time researchers, along with 5-10 MSc students.

Principal investigator at core research grants

- 2025-2029: Young researcher programme – Gašper Golob (48 PMs)
- 2024-2028: Young researcher programme – Jon Vehovar (48 PMs)
- 2023-2027: NCN-ARRS N2 – 0275, "Inertial effects on fluid flow in complex porous media" (28 PM)
- 2022-2026: Young researcher programme – Andrej Kolar Požun (48 PMs)
- 2021-2024: ARRS J3-3115, "AiCoachU – Artificial Intelligence is Coaching You" (17 PM)
- 2021-2024: ARRS J2-3048, "Advanced modelling of radio channels using ray-optical and numerical meshless methods" (15 PM)
- 2020-2027: Head of the core research program P2-0095 "Parallel and Distributed Systems" (216 PMs)
- Coordinates collaboration among three groups from different organizations.
- 2020-2023: ARRS J7-2599, "Decay of an invasive ctenophore bloom as a perturbation to the coastal marine microbial community – from molecules to ecosystem – an integrated interdisciplinary approach, IJS" (10 PMs)
- 2020-2023: ARRS J1-2479, "Past climate and glaciation at the Alps-Dinarides junction" (12 PMs)
- 2020-2024: Young researcher programme – Miha Rot (48 PMs)
- 2017-2020: Young researcher programme – Jure Slak (36 PMs)

Leader of applied projects

- 2025-2026: GreenSwitch – SUMO interface upgrade, Operato Ltd. (10 k€),
- 2024-2025: DiTeR software redesign (70 k€)
- 2023-2024: Prototype Implementation of a microscale meteorological model (70 k€)
- 2023: TransnetBW: Analysis of dynamic thermal rating using measured weather data (20 k€)
- 2021-2023: TrafoFlex: Advanced concept of efficient use of transformers leveraging the dtr technology, Energy agency (122 k€)
- 2022-2023: DTR pilot project with lithuanian transmission operator litgrid, Operato Ltd. (10 k€)
- 2021-2022: Forecasting maintenance interventions of on-load tap changer with advanced analytics, ELES Ltd. (45 k€)
- 2021-2026: A contract for the maintenance of the DTRi software within the SUMO, ELES Ltd. (70 k€)
- 2021: Consultative agreement, Operato Ltd. (10 k€)
- 2021: Coupling of BFM and Croco Models, National Institute for Biology (15 k€)
- 2020: Development of 3D printing simulation tool, SinusPro, GmbH, Austria (13 k€)
- 2019-2020: Conceptual solution for the uncertainty estimation of the dynamic thermal rating, ELES, Ltd. (80 k€)
- 2019: Dynamic thermal rating: Croatian power grid system – pilot deploy, HOPS Ltd Croatia (20 k€)
- 2018-2021: Development and deployment of the DTR on the Slovenian transmission network, ELES Ltd. (200 k€)
- 2017: Cooling of overhead conductors at a horizontal wind velocity below 0.6 m/s, ELES Ltd. (85 k€)
- 2016: DTR of overhead lines in icing regimes, Technology transfer in computing systems, EU FP7 TTP (75 k€)
- 2014-2015: Analysis of de-icing by operational Countermeasures, ELES Ltd. (125 k€)
- 2012: Parallelization of north Atlantic Princeton ocean model, National Institute for Biology (5 k€)

Principal investigator at EU Research Project

- 2024-2027: HEDGE-IoT: "Holistic Approach towards Empowerment of the Digitalization of the Energy Ecosystem through Adoption of IoT Solutions" (21 PM)

Active participation in other projects:

- 2025-2028: SLAIF (AI Factories)

- 2019-2023: MC Member of COST Action CA18203
- 2017-2018: EIMV; Development and Implementation of Dynamic Thermal Model for Power Transformers
- 2016-2019: FWO; Multi-analysis of Fretting Fatigue Using Physical and Virtual Experiments
- 2015: TT; System for Mobile Monitoring of Vital Physiological Parameters and Environmental Context
- 2014-2015: Oleum Trading Systems; Development and Implementation of Algorithms for Time Series Analysis
- 2012-2014: HiPEAC; European Network on High Performance and Embedded Architecture and Compilation
- 2012-2013: BI-ME/012-13-005; Cellular and Final Automata for Pattern Recognition

Pedagogic Work

- 2025- : Associate Professor, Mathematical Modelling and Scientific Computing, MPŠ
- 2025- : PhD advisor, "Oversampled RBF-FD method", Gašper Golob
- 2024- : PhD advisor, "Domain decomposition techniques in meshless", Jon Vehovar
- 2022-: PhD Advisor, "Understanding the effect of stencil selection on stability and accuracy of RBF-FD in conjunction with electromagnetic scattering problems", Andrej Kolar Požun
- 2022-: PhD Advisor, "Adaptive solution of Navier-Stokes equation", Nika Mlinarič Hribar
- 2020-2025: PhD Advisor, "Dimension independent approach to solving systems of PDEs", Miha Rot
- 2019-2024: PhD Advisor, "Meshless adaptive solution procedure for efficient solving of partial differential equations", Mitja Jančič
- 2019-2020: PhD Co-Advisor, "Determination of emissivity model for overhead power lines", Arin Hovanessian
- 2017-2020: PhD Advisor, "Adaptive RBF-FD method", Jure Slak
- 2016-2018: PhD Co-Advisor, "Three-Phase State Estimation in Power Distribution Systems", Urban Kuhar
- 2015-2020: Advising Master's Students from the Faculty of Mathematics and Physics at the University of Ljubljana (approx. 30 students since 2015)
- 2006-2011: Teaching Assistant for Physics/Thermodynamics at the University of Nova Gorica

Reviewer/editor

Editor Positions in Peer-Reviewed Journals:

- Advances in engineering software, ISSN 0965-9978
- International Journal Algorithms, ISSN: 1999-4893

Member of the Editorial Boards:

- International Conference on Parallel, Distributed, Grid and Cloud Computing for Engineering
- DC VIS / Distributed Computing, Visualization and Biomedical Engineering
- International Conference on Engineering Computational Technology
- Miklós Iványi International PhD-DLA Symposiums
- Member of European Network of Excellence on High Performance and Embedded Architecture and Compilation NESUS - Network for Sustainable Ultrascale Computing
- European Network of IEEE

Reviewer for (selected journals):

- Archives of Computational Methods in Engineering
- Journal of Computational Physics
- Applied Mathematical Modelling
- U.S. Department of Energy
- Applied Mathematics And Computation
- Engineering Analysis With Boundary Elements
- International Journal of Heat and Mass Transfer
- Progress in Computational Fluid Dynamics

- International Journal of Computer Mathematics
- Computational Geosciences

Publication Statistics

- Peer-Reviewed Articles: 56 (6 in A'' and 37 in Q1 journals)
- Papers in Conference Proceedings: 65
- Book Chapters: 4
- Scientific Monographs: 2 (Published by Springer)
- Invited Talks: 7
- technical reports: 8

Citation Metrics

- Web of Science (WoS) / SCOPUS: 816 citations, h-index 16
- Google Scholar: 1890 citations, h-index 26
- ResearchGate: 1738 citations, h-index 26, research interest 1355

Selected publications

- M. Rot, G. Kosec; Refined radial basis function-generated finite difference analysis of non-Newtonian natural convection, Physics of Fluids, vol. 37, iss. 3, 2025 [DOI: 10.1063/5.0257896]
- M. Depolli, N. Verdel, G. Kosec; Offline synchronization of signals from multiple wireless sensors, IEEE Sensors Journal, vol. 25, iss. 4, 2025 [DOI: 10.1109/JSEN.2024.3519905
- M. Jančič, G. Kosec; Strong form mesh-free hp-adaptive solution of linear elasticity problem, Engineering with Computers, vol. 40, 2024 [DOI: 10.1007/s00366-023-01843-6]
- M. Jančič, M. Založnik, G. Kosec; Meshless interface tracking for the simulation of dendrite envelope growth, Journal of Computational Physics, vol. 507, 2024 [DOI: 10.1016/j.jcp.2024.112973]
- U. Duh, V. Shankar, G. Kosec; Discretization of non-uniform rational B-spline (NURBS) models for meshless isogeometric analysis, Journal of Scientific Computing, 2024 [DOI: 10.1007/s10915-024-02597-z]
- M. Depolli, J. Slak, G. Kosec; Parallel domain discretization algorithm for RBF-FD and other meshless numerical methods for solving PDEs, Computers & Structures, 2022 [DOI: 10.1016/j.compstruc.2022.106773]
- J. Slak, G. Kosec; Medusa: A C++ library for solving PDEs using strong form mesh-free methods, ACM Transactions on Mathematical Software, vol. 47, 2021 [DOI: 10.1145/3450966]
- J. Slak, G. Kosec; On generation of node distributions for meshless PDE discretizations, SIAM Journal on Scientific Computing, vol. 41, 2019 [DOI: 10.1137/18M1231456]
- G. Kosec, M. Maksić, V. Djurica; Dynamic thermal rating of power lines: model and measurements in rainy conditions, International Journal of Electrical Power & Energy Systems, vol. 91, 2017 [DOI: 10.1016/j.ijepes.2017.04.001]
- G. Kosec; A local numerical solution of a fluid-flow problem on an irregular domain, Advances in Engineering Software, vol. 120, 2018 [DOI: 10.1016/j.advengsoft.2016.05.010]
- G. Kosec, B. Šarler; Simulation of macrosegregation with mesosegregates in binary metallic casts by a meshless method, Engineering Analysis with Boundary Elements, 2014 [DOI: 10.1016/j.enganabound.2014.01.016]
- G. Kosec, M. Depolli, A. Rashkovska, R. Trobec; Super linear speedup in a local parallel meshless solution of thermo-fluid problem, Computers & Structures, vol. 133, 2014 [DOI: 10.1016/j.compstruc.2013.11.016]

Descriptive CV

Gregor Kosec graduated from the University of Ljubljana, Faculty of Mathematics and Physics, in 2006 and received his PhD from the University of Nova Gorica in 2011. In 2011, he became a member of the Parallel and Distributed Systems Laboratory at the Jožef Stefan Institute and in 2020 he became the head of the laboratory. His main research interests are numerical modelling,

meshless methods and generic programming. In collaboration with colleagues, he published 47 peer-reviewed original scientific papers, two scientific monographs with Springer, 4 book chapters and presented his work at 58 international conferences. He has been awarded 4 international prizes and 2 national prizes, namely with reward for exceptional contribution to the sustainable development and the Puh Certificate of Recognition. He is an active reviewer for several international scientific journals, organises international conferences.

In 2016, Gregor was involved in the FWO-funded project "Multi-analysis of fretting fatigue using physical and virtual experiments' as a WP leader. He led (is leading) 5 young researcher programmes and four core research grants in which JSI was involved as a partner institution. From 2023, he is cooperating with the Institute of Theoretical Physics at the University of Wroclaw in a joint project dealing with inertial effects in the fluid flow in complex porous media under the NCN-ARIS grant. Since 2025 he is also associate professor at Jozef Stefan International Postgraduate School, where he introduced new course Mathematical Modelling and Scientific Computing.

Gregor Kosec carried out several applied projects totalling approximately 1 M€ in the last nine years. Starting with the "Analysis of deicing by operational countermeasures" for national transmission System Operator, followed by the Dynamic Thermal Rating of overhead power lines in icing conditions (DTRi) project funded by FP7 TETRACOM. In 2018 he led the project "Cooling of overhead power lines in low wind conditions" and in 2019 "Dynamic determination of DTR uncertainty", also for ELES Ltd. From 2021 to 2023 Gregor led three applied projects related to asset management in the power sector. Together with colleagues from JSI and Elektroinštitut Milan Vidmar, he proposed the technological innovation DiTeR, a modular TRL9 software for predicting the thermal state of power lines in given operating and weather conditions, which was successfully commissioned in 2019 for 27 transmission lines in the Slovenian power grid. DiTeR has been marketed globally by company Operato since 2020 and has so far been tested in pilot projects in Croatian, Lithuanian, Canadia, Uruguayan and Israeli transmission networks. In 2020 he led a project devoted to formulation of uncertainty determination in DTR process, which led to the implementation of module that is in operation since 2021. In 2023 he also assisted the Bavarian operator TransnetBW in the transition from static to dynamic operation. In 2023, he lead and conducted research in development of advanced concept of efficient use of transformers leveraging the DTR technology that has been caried out for Slovenian Electricity Distribution Operator. In 2024 he led the project dealing with implementation of a microscale meteorological model. In 2024 he started a project dealing with model and code redesign for operation DTR software for company Operato. Since 2024 he is PI in H2020 project "Holistic Approach towards Empowerment of the DiGitalization of the Energy Ecosystem through adoption of IoT solutions".