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CURRICULUM VITAE

Employment

- Oct 2021¹ – c.t.: **Postdoctoral Fellow**, Institute of Mathematics of the Czech Academy of Sciences, Czech Republic.
- Dec 2020 – March 2021: Volunteer Researcher, Complex Materials Lab, Arizona State University, United States.
- Aug 2020 – Dec 2020: **Postdoctoral Research Scholar** at the School for Engineering of Matter, Transport and Energy, Arizona State University², United States.
- Aug 2014 – May 2020: **Research Assistant** and **Teaching Assistant** at the Department of Mathematical Sciences, University of Texas at Dallas, United States.
- Feb 2014 – Jun 2014: **Teaching Assistant**, Department of Mathematics, Voronezh State University, Russia.

Education

- Aug 2014 – May 2020: **PhD in Mathematics**, Department of Mathematical Sciences, University of Texas at Dallas, United States. Oral defence date: 30 March 2020, supervisor: Oleg Makarenkov, thesis title: “On the stability of Moreau’s sweeping process with applications to networks of elastoplastic springs”.
- Oct 2012 – Aug 2014: PhD student in Mathematics, Department of Mathematics, Voronezh State University, Russia. Supervisor: M. I. Kamenskii.
- Sep 2010 – Jun 2012: **MS in Mathematics**, Department of Mathematics, Voronezh State University, Russia. Thesis supervisor: M. I. Kamenskii.
- Sep 2006 – Jun 2010: **BS in Mathematics**, Department of Mathematics, Voronezh State University, Russia. Undergraduate thesis supervisor: M. I. Kamenskii.

Funded projects

- Jan 2022 – Dec 2023: project L100192151 “*Unilaterally constrained evolution*” funded by the “Programme to support prospective human resources – post Ph.D. candidates” of the Czech Academy of Sciences.

¹ The gap in 2021 between the positions is due to an unexpectedly lengthened visa process in times of COVID-19 pandemic.

² ASU was ranked “No. 1 in innovation” by the U.S. News & World Report in 2020.

Peer-reviewed articles with impact factor

- [1] Gudoshnikov I., *Regularity lost: the fundamental limitations and constraint qualifications in the problems of elastoplasticity*, Discrete. Contin. Dyn. Syst. (formerly Ser. A), early access, [doi: 10.3934/dcds.2026034](https://doi.org/10.3934/dcds.2026034)
- [2] Gudoshnikov I., Jiao Y., Makarenkov O., Chen D. *Sweeping process approach to stress analysis in elastoplastic Lattice Springs Models with applications to Network Materials*. Phys. Rev. E 112, 065501, (2025) [doi: 10.1103/2jdr-ck1m](https://doi.org/10.1103/2jdr-ck1m)
- [3] Gudoshnikov I., Křížek M. *Stress solution of static linear elasticity with mixed boundary conditions via adjoint linear operators*. J. Math. Anal. Appl. 543.2, Part 2 (2025), p. 128986. [doi: 10.1016/j.jmaa.2024.128986](https://doi.org/10.1016/j.jmaa.2024.128986)
- [4] Gudoshnikov I., Makarenkov O., Rachinskii D. *Formation of a nontrivial finite-time stable attractor in a class of polyhedral sweeping processes with periodic input*. ESAIM: COCV 29 (2023) 84. [doi: 10.1051/cocv/2023074](https://doi.org/10.1051/cocv/2023074)
- [5] Gudoshnikov I., Makarenkov O., Rachinskii D. *Finite-time stability of polyhedral sweeping processes with application to elastoplastic systems*. SIAM J. Control Optim. 60 (3), 2022, 1320-1346. [doi: 10.1137/20M1388796](https://doi.org/10.1137/20M1388796)
- [6] Gudoshnikov I., Makarenkov O. *Stabilization of the response of cyclically loaded lattice spring models with plasticity*. ESAIM: COCV 27 S8 (2021), [doi: 10.1051/cocv/2020043](https://doi.org/10.1051/cocv/2020043)
- [7] Gudoshnikov I., Kamenskii M., Makarenkov O., Voskovskaia N. *One-period stability analysis of polygonal sweeping processes with application to an elastoplastic model*. Math. Model. Nat. Phenom., 15 (2020) 25, [doi: 10.1051/mmnp/2019030](https://doi.org/10.1051/mmnp/2019030)
- [8] Gudoshnikov I., Makarenkov O. *Structurally stable families of periodic solutions in sweeping processes of networks of elastoplastic springs*. Phys. D, 132443. [doi: 10.1016/j.physd.2020.132443](https://doi.org/10.1016/j.physd.2020.132443)
- [9] Wadippuli Achchige L. N., Makarenkov O., Gudoshnikov I. *Global asymptotic stability of nonconvex sweeping processes*. Discrete Contin. Dyn. Syst. Ser. B, (2020) 25 (3) : 1129-1139. [doi:10.3934/dcdsb.2019212](https://doi.org/10.3934/dcdsb.2019212)
- [10] Gudoshnikov I., Kamenskii M., Nistri P. *Exponential stability of positive semigroups in Banach spaces*. J. Math. Anal. Appl. 429 (2015), no. 2, 833–848. [doi:10.1016/j.jmaa.2015.04.041](https://doi.org/10.1016/j.jmaa.2015.04.041)

Submitted articles

- [S1] Gudoshnikov I. *Elastoplasticity with softening as a state-dependent sweeping process: non-uniqueness of solutions and emergence of shear bands in lattices of springs*, [arXiv:2508.16333](https://arxiv.org/abs/2508.16333), submitted to Math. Eng.

Proceedings and other publications

- [P1] Kamenskii, M., Gudoshnikov I. *On stability of perturbed semigroups in partially ordered Banach spaces*. J. Math. Sci. (N.Y.) 233 (2018), no. 6, 853–874. [doi:10.1007/s10958-018-3970-2](https://doi.org/10.1007/s10958-018-3970-2)

[P2] Zvereva M., Gudoshnikov I., Kamenskii M. *The wave equation with the condition of hysteresis type*. Actual directions of scientific researches of the XXI century theory and practice 2(5) (2014): 69-70 (in Russian)

[P3] Gudoshnikov I. *On the stability of solutions to the perturbed Cauchy problem in the spaces with cones*. Voronezh Spring Mathematical School "Modern Methods in Theory of Boundary Value Problems" – "Pontryagin Readings – XXIV" (2013) 63-64 (in Russian)

[P4] Gudoshnikov I. *On the Truchet tiles and coverings*. Proceedings of the Department of Mathematics of Voronezh State University, 11 (2007) 49-68. (in Russian)

Supported participation in other projects

- Actively contributed to the conception, preparation, application and implementation of currently running (2024-2026) GAČR project GA24-10586S led by Prof. Michal Křížek (team of Prof. Pavel Krejčí, Dr. Giselle Antunes Monteiro, Dr. Gudoshnikov).
- Supported by GAČR project GA20-14736S of Prof. Pavel Krejčí and Dr. Giselle Antunes Monteiro during Oct 2021 – Dec 2021.
- The postdoctoral position at the Arizona State University was supported by NSF CMMI-1916878 grant of the head of ASU Complex Materials Lab Prof. Yang Jiao.
- During his PhD at the University of Texas at Dallas Gudoshnikov was partially supported by NSF CMMI-1436856 and CMMI-1916876 grants of his PhD supervisor Prof. Oleg Makarenkov.

Selected recent presentations at scientific events

- 27 September 2024 - invited lecture "*Sweeping process in stress-based models of elastoplasticity*", conference "Control of State Constrained Dynamical Systems 2024", University of Padua, Italy
- 12 Oct 2023 - talk "*Solving elastoplasticity with softening in spring network models via a state-dependent sweeping process*", conference "Variational and Geometric Structures for Evolution", Levico Terme, Italy.

Awards

- Betty and Gifford Johnson Scholarship (\$500), 2017
- A scholarship by Informsvyaz' communications company awarded for winning a contest of programming projects (\$2000), 2012, Voronezh, Russia

Mentorship

Mentored undergraduate student Jackson Forner on the topics of graph theory, convex analysis and mathematical programming as a part of graduate students' volunteering initiative during Fall 2019 - Spring 2020. On 9/12/2019 Jackson Forner delivered a presentation "*Polytopes and flow networks*" at a seminar in the department. Jackson was later accepted to the PhD program on Computational and Applied Mathematics in Rice University, US.

Referee service

Numer. Funct. Anal. Optim., SN Appl. Sci., Results Appl. Math., Optimization, SIAM J. Control Optim., Math. Eng.