Zdeněk Mihula

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Employment

since 2024 Associate Professor. Department of Mathematics, Faculty of Electrical Engineering, Czech Technical University in Prague.

2020–2024 Assistant Professor. Department of Mathematics, Faculty of Electrical Engineering, Czech Technical University in Prague.

Degrees

2024 **doc.**, *'docent' in Applied Mathematics*, Faculty of Electrical Engineering, Czech Technical University in Prague
Reduction Operators, Weighted Inequalities, and Noncompact Sobolev Embeddings

2022 **Ph.D.**, *Doctoral's program, Mathematical Analysis*, Faculty of Mathematics and Physics, Charles University
Classical operators of harmonic analysis and Sobolev embeddings on rearrangement-invariant function spaces

2018 **RNDr.**, *Rerum Naturalium Doctor in mathematics*, Faculty of Mathematics and Physics, Charles University
Optimality of function spaces for classical integral operators

Awards

2024 Dean's award to the best teachers, Complex Analysis, lecture, winter term 2023/2024, Faculty of Electrical Engineering, Czech Technical University in Prague

2022 Dean's award to the best teachers, Mathematical Analysis 2, practicals, summer term 2021/2022, Faculty of Electrical Engineering, Czech Technical University in Prague

2019 Dean's award to the best teachers, Mathematical Analysis 2, practicals, summer term 2018/2019, Faculty of Mathematics and Physics, Charles University

2017 first prize in "Students Scientific and Expert Activity" in the section Mathematical Analysis, awarded by the Czech Mathematical Society

Research Grants

since 2023 grant no. GA23-04720S of the Czech Science Foundation, team member

2019–2021 grant no. 1056119 of the Grant Agency of Charles University, principal investigator

2019–2020 Fulbright grant no. 2019-22-03 (research stay, The Ohio State University, OH, US)

Research Fellowships

2019–2020 research stay at The Ohio State University (OH, US) as a Fulbrighter

Organization of Conferences and Workshops

2023 *Spring School on Analysis 2023* (Chair), Paseky nad Jizerou, Czech Republic

2022 International Conference *Nonlinear Analysis, Function Spaces and Applications 12* (Chair), Praha, Czech Republic

2021 International Conference *LUBOŠ60* (co-organizer), Železná Ruda, Czech Republic

2020 International Workshop *QIND60* (Chair), Špindlerův Mlýn, Czech Republic

2019 *Spring School on Analysis 2019* (co-organizer), Paseky nad Jizerou, Czech Republic

Teaching

CTU FEE lectures (Complex Analysis), practicals (Complex Analysis, Complex Analysis and Transformations, Mathematical Analysis 2)

CUNI MFF Seminar on Basic Properties of Function Spaces, during the period 2016–2019 also practicals (Mathematical Analysis 1–4, Mathematics for Physicists 1)

Supervision of Students

Ph.D. • Ladislav Drážný, CUNI MFF, since 2023

Master • Ladislav Drážný, CUNI MFF, thesis *Optimal function spaces in weighted Sobolev embeddings with monomial weight* defended in 2023 with grade "excellent"

Bachelor • Maximilián Pándy, CUNI MFF, since 2024

Advisor • Ivan Kotalík (master's thesis), CUNI MFF, since 2024

• Anna Kneselová (bachelor's thesis), CUNI MFF, defended in 2024 with grade "excellent"

• Tomáš Beránek (master's thesis), CUNI MFF, since 2023

Invited Talks

2025 an invited lecture at *Taiwan Winter School in Analysis 2025* organized by National Taiwan Normal University, Jiaoxi, Taiwan

2024 an invited lecture at mini-symposium *Function spaces and related topics* at the 9th European Congress of Mathematics, Sevilla, Spain

Editorial Work

2023 *Function Spaces and Applications XII*, proceedings of the Spring School on Analysis 2023, Paseky nad Jizerou, Czech Republic, 2023. MatfyzPress, Prague 2023, ix+136 pp., ISBN 978-80-7378-485-0 (with Jaroslav Lukeš, Luboš Pick, and Hana Turčinová).

Selected Talks at Conferences, Seminars, and Workshops

- *Nonlinear Analysis Seminar* (National Taiwan Normal University), *Analysis and Operator Theory Seminar* (The Ohio State University), Summer school *Analysis und Theoretische Numerik* in Siegmundsburg (FSU Jena), mini-symposium *Geometric-functional inequalities and related topics* at the 8th European Congress of Mathematics (Portorož, Slovenia), *Friday seminar* (Mathematical Institute of the University of Bonn), session *Function Spaces and Applications* at 12th International ISAAC Congress (Aveiro, Portugal), *RomFin 2019 and FSDONA 2019* (Turku, Finland), section *Special Session on Recent Advances in Approximation Theory and Operator Theory* at the AMS Sectional Meeting (Columbus, Ohio, USA), workshop on *Function Spaces* (Jena, Germany), workshop on *Analysis, Approximation Theory, Operator Theory and their Interconnections* (The Ohio State University)

Committees

since 2024 member of the committee for doctoral studies P4M3 (mathematical analysis) at Faculty of Mathematics and Physics, Charles University

since 2023 member of the committee no. 20460 for the state final doctoral examinations and Ph.D. defenses (branch Mathematical analysis) at Faculty of Mathematics and Physics, Charles University

Unions

since 2024 member of the *European Mathematical Society*

since 2023 elected member of the *European Mathematical Society Young Academy*; member of the EMYA Committee

since 2017 member of the *Union of Czech Mathematicians and Physicists* and its section the *Czech Mathematical Society*

Reviews

- full referee reports for *Anal. Math.*, *Ann. Funct. Anal.*, *Ann. Mat. Pura Appl.*, *Bull. Lond. Math. Soc.*, *Czech. Math. J.*, *Hacet. J. Math. Stat.*, *J. Math. Anal. Appl.*, *Proc. Roy. Soc. Edinburgh Sect. A*, *Studia Math.*, and *Stud. Sci. Math. Hung.*
- reviews for *MathSciNet Mathematical Reviews*

Citations

MathSciNet 41 citations by 31 authors

Web of Science 51 citations (32 without self-citations), 37 citing articles (27 without self-citations)

Publications

online 2024 J. Lang, Z. Mihula, L. Pick. Maximal noncompactness of limiting Sobolev embeddings. *Proc. Roy. Soc. Edinburgh Sect. A*, Online First (2024), 19 pp. doi: 10.1017/prm.2024.93

2024 M. Křepela, Z. Mihula, J. Soria. Rearrangement-invariant hulls of weighted Lebesgue spaces. *J. Funct. Anal.* 287 (2024), no. 2, paper no. 110454, 20 pp. doi: 10.1016/j.jfa.2024.110454

2023 Z. Mihula. Optimal behavior of weighted Hardy operators on rearrangement-invariant spaces. *Math. Nachr.* 296 (2023), no. 8, 3492–3538. doi: 10.1002/mana.202200015

2023 J. Lang, Z. Mihula. Different degrees of non-compactness for optimal Sobolev embeddings. *J. Funct. Anal.* 284 (2023), no. 10, paper no. 109880, 22 pp. doi 10.1016/j.jfa.2023.109880

2023 M. Křepela, Z. Mihula, J. Soria. A Weak-Type Expression of the Orlicz Modular. *Mediterr. J. Math.* 20 (2023), no. 3, paper no. 113, 8 pp. doi: 10.1007/s00009-023-02315-3

2022 P. Cavaliere, Z. Mihula. Compactness of Sobolev-type embeddings with measures. *Commun. Contemp. Math.* 24 (2022), no. 9, paper no. 2150036, 41 pp. doi: 10.1142/S021919972150036X

2022 S. Baena-Miret, A. Gogatishvili, Z. Mihula, L. Pick. Reduction principle for Gaussian K-inequality. *J. Math. Anal. Appl.* 516 (2022), no. 2, paper no. 126522, 23 pp. doi: 10.1016/j.jmaa.2022.126522

2022 M. Křepela, Z. Mihula, H. Turčinová. Discretization and antidiscretization of Lorentz norms with no restrictions on weights. *Rev. Mat. Complut.* 35 (2022), no. 2, 615–648. doi: 10.1007/s13163-021-00399-7

2022 J. Lang, Z. Mihula, L. Pick. Compactness of Sobolev embeddings and decay of norms. *Studia Math.* 265 (2022), no. 1, 1–35. doi: 10.4064/sm201119-29-9

2022 A. Gogatishvili, Z. Mihula, L. Pick, H. Turčinová, T. Ünver. Weighted inequalities for a superposition of the Copson operator and the Hardy operator. *J. Fourier Anal. Appl.* 28 (2022), no. 2, paper no. 24, 24 pp. doi: 10.1007/s00041-022-09918-6

2021 Z. Mihula. Poincaré-Sobolev inequalities with rearrangement-invariant norms on the entire space. *Math. Z.* 298 (2021), no. 3-4, 1623-1640. doi: 10.1007/s00209-020-02652-z

2021 D.E. Edmunds, J. Lang, Z. Mihula. Measure of noncompactness of Sobolev embeddings on strip-like domains. *J. Approx. Theory* 269 (2021), paper no. 105608, 13 pp. doi: 10.1016/j.jat.2021.105608

2021 Z. Mihula. Embeddings of homogeneous Sobolev spaces on the entire space. *Proc. Roy. Soc. Edinburgh Sect. A* 151 (2021), no. 1, 296-328. doi: 10.1017/prm.2020.14

2020 D.E. Edmunds, Z. Mihula, V. Musil, L. Pick. Boundedness of classical operators on rearrangement-invariant spaces. *J. Funct. Anal.* 278 (2020), no. 4, paper no. 108341, 56 pp. doi: 10.1016/j.jfa.2019.108341

2019 P. Cavaliere, Z. Mihula. Compactness for Sobolev-type trace operators. *Nonlinear Anal.* 183 (2019), 42-69. doi: 10.1016/j.na.2019.01.013

Preprints

submitted Z. Mihula, L. Pick, D. Spector. Potential trace inequalities via a Calderón-type theorem. 30 pp. arXiv:2407.03986

submitted J. Malý, Z. Mihula, V. Musil, L. Pick. Maximal noncompactness of embeddings into Marcinkiewicz spaces. 22 pp. arXiv:2404.04694

submitted P. Gurka, J. Lang, Z. Mihula. Quantitative analysis of optimal Sobolev-Lorentz embeddings with α-homogeneous weights. 17 pp. arXiv:2307.03127

submitted Z. Mihula. Optimal Sobolev inequalities in the hyperbolic space. 48 pp. arXiv:2305.06797

submitted A. Gogatishvili, Z. Mihula, L. Pick, H. Turčinová, T. Ünver. Embeddings between generalized weighted Lorentz spaces. 62 pp. arXiv:2210.12988