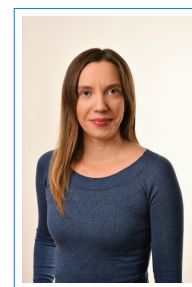


Katja Berčič

Mathematical-knowledge infrastructure
& research software

✉ katja.bercic@fmf.uni-lj.si
🌐 katja.not.si
👤 GitHub: [katjabercic](https://github.com/katjabercic)
🆔 0000-0002-6678-8975
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Profile

Mathematician (PhD, graph theory) and software engineer working on infrastructure for mathematical research data. I build and maintain open, live systems that connect the mathematical literature, proof assistants (Lean), computer algebra systems, and structured databases, making mathematical data findable, interoperable, and usable by both mathematicians and machines. Recent systems include mathswitch, MathDataHub, and Lean-HoG.

Built & deployed systems

- mathswitch.xyz** An interface to a knowledge graph of mathematics. It aligns concepts across encyclopedic and reference sources (e.g., Wikidata, Wikipedia, nLab) and the Agda Unimath formal library. Creator and maintainer (with S. Stanojevikj). Open source: github.com/katjabercic/mathswitch.
- MathDataHub** Platform for mathematical research data that generates databases and browsable interfaces from high-level schemas, designed to support formalized metadata. Co-developer (with the KWARC group, FAU Erlangen-Nürnberg). data.mathhub.info.
- mathbases.org** Editorial board member of mathbases.org, a community-curated index of mathematical databases ("of, by, and for mathematical databases"; 130+ entries); creator of its precursor, mathdb.mathhub.info.
- Lean-HoG** The House of Graphs database verified inside the Lean proof assistant, using certificates so that Lean constructs proofs efficiently. Co-author (with A. Bauer, G. Devillez, J. Taslak). Open source: github.com/katjabercic/Lean-HoG.
- DiscreteZOO** Data repository, website, and SageMath package for highly symmetric graphs. Co-developer (with J. Vidali). Open source: github.com/DiscreteZOO.

Appointments

- 2025–present **Team member, BRIDGE, AI for Math Fund 2025**
Bridging AI, proof assistants, and mathematical data (Renaissance Philanthropy).
- 2020–present **Researcher, TA, University of Ljubljana, Faculty of Mathematics and Physics**
Mathematical-knowledge infrastructure and data interoperability.
- 2018–2020 **Postdoctoral researcher, FAU Erlangen-Nürnberg**
“Infrastructures for mathematical data”, with M. Kohlhase.
- 2017–2018 **Postdoctoral researcher, CCM, UNAM, Morelia**
Maniflexes and abstract polytopes, with D. Pellicer.
- 2016–2017 **Software engineer, Evolve d.o.o. and Ibigo d.o.o.**
Production software: full-stack and platform development.
- 2014–2016 **Researcher, Jožef Stefan Institute**
Data analysis on the FI-IMPACT project (assessment of the Future Internet PPP).
- 2010–2014 **Junior researcher, IMFM and UP FAMNIT**
Algebraic graph theory, with P. Potočnik.

Selected publications

- 2026 K. Berčič. *Data and Data Quality in Mathematics*. In *Data Quality Matters*, IntechOpen. doi:10.5772/intechopen.1013831.
- 2024 A. Bauer, K. Berčič, G. Devillez, J. Taslak. *Incorporating a Database of Graphs into a Proof Assistant*. *Intelligent Computer Mathematics (CICM 2024)*, LNCS 14960, 146–162. doi:10.1007/978-3-031-66997-2_9.
- 2020 K. Berčič, M. Kohlhase, F. Rabe. *(Deep) FAIR Mathematics*. *it – Information Technology* 62(1):7–17. doi:10.1515/itit-2019-0028.
- 2020 K. Berčič, M. Kohlhase, F. Rabe. *Towards a Heterogeneous Query Language for Mathematical Knowledge*. *Intelligent Computer Mathematics (CICM 2020)*, LNCS 12236, 39–54. doi:10.1007/978-3-030-53518-6_3.
- 2020 K. Berčič, J. Vidali. *DiscreteZOO: A Fingerprint Database of Discrete Objects*. *Mathematics in Computer Science* 14(3):559–575. doi:10.1007/s11786-020-00453-5.
- 2019 K. Berčič, M. Kohlhase, F. Rabe. *Towards a Unified Mathematical Data Infrastructure: Database and Interface Generation*. *Intelligent Computer Mathematics (CICM 2019)*, LNCS 11617, 28–43. doi:10.1007/978-3-030-23250-4_3.
- earlier Graph theory: P. Potočnik, K. Berčič, *Two-arc-transitive two-valent digraphs of certain orders*, *Ars Math. Contemp.* 11(1):127–146, 2015; K. Berčič, M. Ghasemi, *Tetravalent arc-transitive graphs of order twice a product of two primes*, *Discrete Math.* 312(24):3643–3648, 2012.

Teaching & field-building

- 2023 Outreach talk on knowledge databases for mathematics, UP Alumni week.
- 2020–present **Teaching assistant**, *University of Ljubljana, FMF*
Programming 1; Computer practicum.
- 2019–2020 **Coordinating teaching assistant**, *FAU Erlangen-Nürnberg*
Artificial Intelligence I & II.

Leadership, community & service

- 2026 Organizing committee, CICM, Ljubljana.
- 2024–2025 Program committee, CICM.
- 2024–present Steering committee, code4math (sociotechnical infrastructure for mathematics).
- 2023 Organizing committee, Dagstuhl seminar “Automated mathematics: integrating proofs, algorithms and data”.
- 2022 Independent verification of Slovenian national and local election results, with A. Bauer (State Election Commission and Genis); the resulting joint analysis was presented at Cross-disciplinary Research in Computational Law (CRCL 2023).
- 2020 Section organizer, International Congress on Mathematical Software (“Trading Mathematical Research Data”); PhD program chair, CICM.
- 2012–2019 Organizing roles at graph-theory and mathematical-software events.

Selected talks

- 2025 *Alignments for Data* (invited). ALIGN 2025 at CICM 2025, Universidade de Brasília.
- 2025 *Do mathematicians dream of data?* (invited). LuCaNT 2025, ICERM, Providence.
- 2024 *Lean-HoG: incorporating a database of graphs into a proof assistant*. Formalization of Mathematics, HIM, Bonn (with J. Taslak).
- 2024 *An invitation to explore mathematical data*. Women in Formal Methods Workshop, Montreal.
- 2019–2021 Talks on mathematical-data infrastructure at CICM, FPSAC, Joint Mathematics Meetings, Sage Days, and the European Congress of Mathematics.

Education

- 2015 **PhD in Mathematics**, *University of Ljubljana, FMF*
Graph theory (symmetric / arc-transitive graphs); supervisor P. Potočnik.
- 2010 **BSc in Mathematics**, *University of Ljubljana, FMF*
Theoretical mathematics.

Memberships

European Mathematical Society; Society of Mathematicians, Physicists and Astronomers of Slovenia.