

Dániel Garamvölgyi

Curriculum Vitae

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Research Interests

Combinatorial rigidity theory, structural graph theory, matroid theory, discrete geometry, (applied) algebraic geometry.

Professional Experience

- Sep 2025 – **Research Fellow**
HUN-REN Egeróráry Research Group on Combinatorial Optimization, Budapest
- Jan 2025 – **Semester Postdoctoral Fellow**
May 2025 *ICERM, Brown University, Providence*
(visiting)
- Sep 2024 – **Research Associate**
Aug 2025 *MTA-ELTE Matroid Optimization Research Group, Budapest*
(part-time / concurrent appointment)
- Jan 2025 – **Research Fellow**
Aug 2025 *Alfréd Rényi Institute of Mathematics, Budapest*
- Sep 2023 – **Predoctoral Fellow**
Dec 2024 *Alfréd Rényi Institute of Mathematics, Budapest*
- Sep 2020 – **Research Assistant**
Mar 2024 *HUN-REN Egeróráry Research Group on Combinatorial Optimization, Budapest*

Education

- 2025 **Ph.D. in mathematics**, Eötvös Loránd University, Budapest.
Advisor: Tibor Jordán Thesis: *Unique reconstruction problems in rigidity theory*
- 2019 **M.Sc. in mathematics**, Eötvös Loránd University, Budapest.
GPA: 5.0/5.0, graduated with honors
- 2016 **B.Sc. in mathematics**, Eötvös Loránd University, Budapest.
GPA: 4.8/5.0, graduated with honors

Awards and Grants

- 2024 **HUN-REN Mobility Program** travel grant
- 2023 **Géza Grünwald Commemorative Prize** of the János Bolyai Mathematical Society
- 2023 **Focus Program on Geometric Constraint Systems** travel grant
- 2019 – 2022 **New National Excellence Programme (ÚNKP)** research grant
- 2018 – 2021 **Human Resources Development Operational Programme (EFOP)** scholarship

Publications

- 2026 **Stable cuts, NAC-colourings and flexible realisations of graphs**
with Katie Clinch, John Haslegrave, Tony Huynh, Jan Leigerský and Anthony Nixon
Journal of Graph Theory (to appear) [arxiv:2412.16018](https://arxiv.org/abs/2412.16018)
- 2026 **Rigidity and reconstruction in matroids of highly connected graphs**
Journal of Combinatorial Theory, Series B 178 [arxiv:2410.23431](https://arxiv.org/abs/2410.23431)

- 2025 **Highly connected orientations from edge-disjoint rigid subgraphs**
with Csaba Király, Tibor Jordán and Soma Villányi
[Forum of Mathematics, Pi 13](#) [arxiv:2401.12670](#)
- 2024 **Partial reflections and globally linked pairs in rigid graphs**
with Tibor Jordán
[SIAM Journal on Discrete Mathematics 38\(3\)](#) [arxiv:2305.03412](#)
- 2024 **Count and cofactor matroids of highly connected graphs**
with Csaba Király and Tibor Jordán
[Journal of Combinatorial Theory, Series B 166](#) [arxiv:2209.06204](#)
- 2023 **Minimally globally rigid graphs**
with Tibor Jordán
[European Journal of Combinatorics 108](#) [arxiv:2202.11617](#)
- 2022 **Global rigidity of (quasi-)injective frameworks on the line**
[Discrete Mathematics 345\(2\)](#)
- 2022 **Globally rigid graphs are fully reconstructible**
with Steven Gortler and Tibor Jordán
[Forum of Mathematics, Sigma 10](#) [arxiv:2105.04363](#)
- 2021 **On the global rigidity of tensegrity graphs**
[Discrete Applied Mathematics 302](#)
- 2021 **Graph reconstruction from unlabeled edge lengths**
with Tibor Jordán
[Discrete & Computational Geometry 66](#)
- 2020 **Global Rigidity of Unit Ball Graphs**
with Tibor Jordán
[SIAM Journal on Discrete Mathematics 34\(1\)](#)

Refereed conference proceedings

- 2025 **On the Rigidity Matroid of Highly Connected Graphs**
Proceedings of the 13th Hungarian–Japanese Symposium on Discrete Mathematics and Its Applications
- 2025 **Towards the Proximity Conjecture on Group-Labeled Matroids**
with Ryuhei Mizutani, Taihei Oki, Tamás Schwarcz and Yutaro Yamaguchi
[ICALP 2025, Leibniz International Proceedings in Informatics 334](#) [arxiv:2411.06771](#)
- 2023 **Algebraic realizations of pairs of closure operators**
Proceedings of the 12th Japanese-Hungarian Symposium on Discrete Mathematics and Its Applications
- 2022 **Globally linked pairs in braced maximal outerplanar graphs**
with Tibor Jordán
Proceedings of the 34th Canadian Conference on Computational Geometry (CCCG 2022)

Preprints

- 2025 **Sufficient conditions for bipartite rigidity, symmetric completability and hyperconnectivity of graphs**
with Bill Jackson, Tibor Jordán and Soma Villányi
[arxiv:2511.00298](#)
- 2025 **Sparsity, stress-independence and globally linked pairs in graph rigidity theory**
with Bill Jackson and Tibor Jordán
[arxiv:2509.03150](#)
- 2023 **Stress-linked pairs of vertices and the generic stress matroid**
[arxiv:2308.16851v2](#)

Talks

- May 2026 *Graph matroid families*, Workshop on Rigid structures in algebraic combinatorics and algebraic statistics, Edinburgh, UK
- May 2026 *Sufficient conditions for bipartite rigidity, symmetric completability and hyperconnectivity of graphs*, Workshop on Rigidity, Algebraic Statistics and Topological Data Analysis, St Andrews, UK
- May 2026 *Algebraic geometry without algebra*, seminar of the Advances in Applied Algebraic Geometry group at KU Leuven, Leuven, Belgium
- Jan 2026 *Sparsity, stress-independence and globally linked pairs in graph rigidity theory*, Workshop on Rigidity, Flexibility and Complexity of Geometric Constraint Systems, Chennai, India
- Oct 2025 *Vertex-connectivity, rigidity and sparsity*, research seminar of the Egerváry Research Group on Combinatorial Optimization, Budapest, Hungary
- Jun 2025 *Stable cuts, planar rigidity, and global rigidity on the line*, Minisymposium on Kinematics, Flexibility and Rigidity at the 10th Conference on Geometry: Theory and Applications, Sopron, Hungary
- May 2025 *On the rigidity matroid of highly connected graphs*, 13th Hungarian-Japanese Symposium on Discrete Mathematics and Its Applications, Tokyo, Japan
- Mar 2025 *What is... the measurement variety?*, Workshop on Matroids, Rigidity, and Algebraic Statistics, Providence, Rhode Island
- Mar 2025 *Algebraic matroids*, ICERM Postdoc Seminar, Providence, Rhode Island
- Oct 2024 *Rigidity and reconstruction in matroids of highly connected graphs*, research seminar of the Egerváry Research Group on Combinatorial Optimization, Budapest, Hungary
- Sep 2024 *Stress-linked pairs of vertices*, NII Shonan Meeting on Theory and Algorithms in Graph Rigidity and Algebraic Statistics, Shonan, Japan
- Aug 2024 *Rigidity and reconstruction in matroids of highly connected graphs*, 2024 Workshop on (Mostly) Matroids, Daejeon, South Korea
- Aug 2023 *Partial reflections and globally linked pairs in rigid graphs*, Workshop on Constraint Systems: Distance Geometry, Structured Polynomials, Matrix Completion and Kinematics, Toronto, Canada
- Jul 2023 *Minimally globally rigid graphs*, Workshop on Geometric Constraints: Materials, Graphs and Matroids, Rigidity and Packings, Toronto, Canada
- Mar 2023 *Algebraic realizations of pairs of closure operators*, 12th Japanese-Hungarian Symposium on Discrete Mathematics and Its Applications, Budapest, Hungary
- Nov 2021 *Graph rigidity and the maximum likelihood threshold*, research seminar of the Egerváry Research Group on Combinatorial Optimization, Budapest, Hungary
- Jun 2021 *Globally rigid graphs are fully reconstructible*, Research Seminar of the Thematic Program on Geometric Constraint Systems, Framework Rigidity, and Distance Geometry, Toronto, Canada (*online*)
- Sep 2020 *The unlabeled reconstruction problem in one dimension*, research seminar of the Egerváry Research Group on Combinatorial Optimization, Budapest, Hungary (*online*)
- Jun 2019 *Global rigidity of unit ball graphs*, Geometric constraint systems: rigidity, flexibility and applications, Lancaster, United Kingdom
- Nov 2018 *Global rigidity of unit ball graphs*, research seminar of the Egerváry Research Group on Combinatorial Optimization, Budapest, Hungary

Workshops and Conferences Attended

- May 2026 *Rigid structures in algebraic combinatorics and algebraic statistics*
ICMS, Edinburgh, UK

- May 2026 *Rigidity, Algebraic Statistics and Topological Data Analysis*
University of St Andrews, St Andrews, UK
- Jan 2026 *BIRS-CMI Workshop on Rigidity, Flexibility and Complexity of Geometric Constraint Systems*
Chennai Mathematical Institute, Chennai, India
- Nov 2025 *Conference on Combinatorial Geometries and Geometric Combinatorics*
Centre de Recerca Matemàtica, Barcelona, Spain
- Jul 2025 *17th Emléktábla Workshop*
Velence, Hungary
- Jun 2025 *10th Conference on Geometry: Theory and Applications (CGTA 2025)*
University of Sopron, Sopron, Hungary
- May 2025 *13th Hungarian-Japanese Symposium on Discrete Mathematics and Its Applications*
Institute of Science Tokyo, Tokyo, Japan
- Mar 2025 *Workshop on Matroids, Rigidity, and Algebraic Statistics*
ICERM, Providence, Rhode Island
- Feb 2025 *Workshop on Circle Packings, Minimal Surfaces, and Discrete Differential Geometry*
ICERM, Providence, Rhode Island
- Sep 2024 *NII Shonan Meeting on Theory and Algorithms in Graph Rigidity and Algebraic Statistics*
Shonan Village Center, Shonan, Japan
- Aug 2024 *2024 Workshop on (Mostly) Matroids*
Institute of Basic Science, Daejeon, South Korea
- Jul 2024 *16th Emléktábla Workshop*
Vác, Hungary
- Apr 2024 *Rigidity in Action*
RICAM, Linz, Austria
- Mar 2024 *Code of rigidity*
RICAM, Linz, Austria
- Mar 2024 *Landscapes of rigidity*
RICAM, Linz, Austria
- Aug 2023 *Workshop on Constraint Systems: Distance Geometry, Structured Polynomials, Matrix Completion and Kinematics*
Fields Institute, Toronto, Canada
- Jul 2023 *Workshop on Geometric Constraints: Materials, Graphs and Matroids, Rigidity and Packings*
Fields Institute, Toronto, Canada
- Mar 2023 *12th Japanese-Hungarian Symposium on Discrete Mathematics and Its Applications*
Eötvös Loránd University, Budapest, Hungary
- Jul 2022 *12th Emléktábla Workshop*
Gárdony, Hungary
- Jan 2020 *Discrete Structures 2020*
Lancaster University, Lancaster, United Kingdom
- Jun 2019 *Geometric constraint systems: rigidity, flexibility and applications*
Lancaster University, Lancaster, United Kingdom

Teaching

Teaching assistant at Eötvös Loránd University, Budapest
Operations Research (Fall 2021 & Fall 2022)
Linear algebra (Fall 2015 & Fall 2016)

Service

Refereed for:

Discrete Applied Mathematics
Discrete Mathematics
Journal of Graph Theory
SIAM Journal on Discrete Mathematics

Discrete & Computational Geometry
Graphs and Combinatorics
J. London Math. Soc.
ACM-SIAM Symposium on Discrete Algorithms (SODA)