# Dániel Garamvölgyi

Curriculum Vitae

#### Personal Information

Nationality: Hungarian ORCID identifier: 0000-0002-8468-6585 Email: daniel.garamvolgyi@ttk.elte.hu Website: https://danielgaramvolgyi.github.io

## **Research Interests**

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

## Professional Experiece

- Jan 2025 -Semester PostdocMay 2025ICERM, ProvidenceJan 2025 -Research FellowAug 2025Alfréd Rényi Institute of Mathematics, BudapestSep 2024 -Research AssociateAug 2025MTA-ELTE Matroid Optimization Research Group, BudapestSep 2023 -Predoctoral FellowDec 2024Alfréd Rényi Institute of Mathematics, BudapestSep 2020 -Research Assistant
- Mar 2024 HUN-REN Egerváry Research Group on Combinatorial Optimization, Budapest

## Education

- 2025 **Ph.D. in mathematics** (*summa cum laude*), 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 630 000 HUF (approx. 1600 EUR at time of receipt)
- 2023 **Géza Grünwald Commemorative Prize** of the János Bolyai Mathematical Society 90 000 HUF (approx. 230 EUR at time of receipt)

- 2023 **Focus Program on Geometric Constraint Systems** travel grant 3 000 CAD (approx. 2000 EUR at time of receipt)
- 2019 2022 **New National Excellence Programme (ÚNKP)** research grant *Awarded three times, 3 600 000 HUF in total (approx. 9000 EUR)*
- 2018 2021 Human Resources Development Operational Programme (EFOP) scholarship 3 982 000 HUF in total (approx. 10 000 EUR)

#### Publications

- 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:2202.11617
- 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

- Towards the Proximity Conjecture on Group-Labeled Matroids
  with Ryuhei Mizutani, Taihei Oki, Tamás Schwarcz and Yutaro Yamaguchi
  Proceedings of the 52nd International Colloquium on Automata, Languages and
  Programming (ICALP 2025)\*, Aarhus, to appear. arxiv:2411.06771
- 2025 **On the Rigidity Matroid of Highly Connected Graphs** Proceedings of the 13th Hungarian–Japanese Symposiumon Discrete Mathematics and Its Applications, to appear.
- 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

- 2024 **Stable cuts, NAC-colourings and flexible realisations of graphs** *with Katie Clinch, John Haslegrave, Tony Huynh, Jan Legerský and Anthony Nixon* submitted. arxiv:2412.16018
- 2024 **Rigidity and reconstruction in matroids of highly connected graphs** submitted. arxiv:2410.23431
- 2023 Stress-linked pairs of vertices and the generic stress matroid submitted. arxiv:2308.16851

#### Talks

- 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 2025	13th Hungarian-Japanese Symposium on Discrete Mathematics and Its Applications Institute of Science Tokyo, Tokyo, Japan
Mar 2025	<i>Workshop on Matroids, Rigidity, and Algebraic Statistics</i> 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	<i>Rigidity in Action</i> 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 Com- pletion 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	<i>Discrete Structures 2020</i> Lancaster University, Lancaster, United Kingdom
Jun 2019	<i>Geometric constraint systems: rigidity, flexibility and applications</i> 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

Discrete & Computational Geometry Graphs and Combinatorics ACM-SIAM Symposium on Discrete Algorithms (SODA)