

# Dániel Garamvölgyi

## Curriculum Vitae

### Personal Information

**Nationality:** Hungarian

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**Website:** <https://danielgaramvolgyi.github.io>

### Research Interests

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

### Professional Experience

Sep 2025 – **Research Fellow**

*HUN-REN Egerváry Research Group on Combinatorial Optimization, Budapest*

Jan 2025 – **Research Fellow**

Aug 2025 *Alfréd Rényi Institute of Mathematics, Budapest*

Jan 2025 – **Semester Postdoctoral Fellow**

May 2025 *ICERM, Brown University, Providence*

Sep 2024 – **Research Associate**

Aug 2025 *MTA-ELTE Matroid Optimization Research Group, Budapest*

Sep 2023 – **Predoctoral Fellow**

Dec 2024 *Alfréd Rényi Institute of Mathematics, Budapest*

Sep 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

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 completnability and hyperconnectivity of graphs**  
with Bill Jackson, Tibor Jordán and Soma Villányi  
submitted. arxiv:2509.00298

2025 **Sparsity, stress-independence and globally linked pairs in graph rigidity theory**  
with Bill Jackson and Tibor Jordán  
submitted. [arxiv:2509.03150](https://arxiv.org/abs/2509.03150)

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](https://arxiv.org/abs/2412.16018)

2024 **Rigidity and reconstruction in matroids of highly connected graphs**  
submitted. [arxiv:2410.23431](https://arxiv.org/abs/2410.23431)

2023 **Stress-linked pairs of vertices and the generic stress matroid**  
submitted. [arxiv:2308.16851v2](https://arxiv.org/abs/2308.16851v2)

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## Talks

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

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## Workshops and Conferences Attended

Nov 2025 *Conference on Combinatorial Geometries and Geometric Combinatorics*  
Centre de Recerca Matemàtica, Barcelona, Spain

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

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## Teaching

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

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## Service

Refereed for:	Discrete Applied Mathematics	Discrete & Computational Geometry
	Discrete Mathematics	Graphs and Combinatorics
	Journal of Graph Theory	J. London Math. Soc.
	SIAM Journal on Discrete Mathematics	ACM-SIAM Symposium on Discrete Algorithms (SODA)