Daniel Herbst

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EDUCATION

Technical University of Munich   03/2025 – Present
PhD in Computer Science   *Munich, Germany*

  Advisor: Stefanie Jegelka

Technical University of Munich   10/2021 – 02/2025
M.Sc. in Mathematics, Minor in Computer Science (Final GPA: 1.0/1.0, with high distinction)   *Munich, Germany*

  Master thesis on transferability/expressivity of graph neural networks with graphon theory, advised by Stefanie Jegelka.
  Selected coursework: Stochastic Analysis, Random Matrix Theory, Mathematical Statistics, High-Dimensional Statistics, Graphical Models in Statistics, Machine Learning, TUM Data Innovation Lab ⎙ ☉.

University of Waterloo   09/2022 – 12/2022
Exchange student in Statistics and Computer Science (Final GPA: 4.0/4.0, 93/100)   *Waterloo, ON, Canada*

  Coursework: Forecasting, Causal Inference, Computer Vision ☉.

Karlsruhe Institute of Technology   10/2018 – 10/2021
B.Sc. in Mathematics, Minor in Computer Science (Final GPA: 1.0/1.0, with distinction)   *Karlsruhe, Germany*

  Bachelor thesis: *Measures on Polish Spaces and Wasserstein Distances*. ⎙
  Selected coursework: Measure Theory, Functional Analysis, Probability Theory, Abstract Algebra, Algorithms, Software Engineering, Theoretical Computer Science.

WORK EXPERIENCE

Boston Consulting Group   10/2023 – 12/2023
Visiting Data Scientist   *Munich, Germany*

  Sustainability and carbon accounting for a major financial institution, using Python + data stack, SQL.

Technical University of Munich   05/2023 – 09/2023
Research Assistant   *Munich, Germany*

  Researched eigenvector-based positional encodings for graph transformers, related in-/equivariances, and longe range interactions for graph neural networks at the *Data Analytics and Machine Learning Group*, using Python, JAX, PyTorch.

Ultramarin   01/2023 – 04/2023
Data Science Intern   *Berlin, Germany*

  Devised, implemented, and evaluated novel uncertainty forecast approaches for financial time series using conformal prediction methods and reinforcement learning methods for asset allocation, using Python + data stack, Scikit-Learn. Led to a talk at the *CEQURA Conference on Advances in Financial and Insurance Risk Management*, 2023.

Fraunhofer IOSB   12/2020 – 08/2021
Research Assistant   *Karlsruhe, Germany*

  Assisted research in human pose estimation and crowd analysis; developed, implemented, and evaluated crowdedness measures and social group detection methods for pedestrian crowds, using Python + data stack.

Karlsruhe Institute of Technology   10/2019 – 09/2020
Teaching Assistant   *Karlsruhe, Germany*

  Held tutorials for ∼30 participants of the lectures Linear Algebra 1 and 2, graded weekly exercise sheets.

AWARDS AND SCHOLARSHIPS

German Academic Scholarship Foundation   01/2019 – 12/2024
Scholarship holder

The *German Academic Scholarship Foundation* (German: *Studienstiftung des deutschen Volkes*) is Germany's largest, oldest and most prestigious scholarship foundation, top ~0.4% of German university students admitted.

PUBLICATIONS

[1] **Higher-Order Graphon Neural Networks: Approximation and Cut Distance.** ⏦
Daniel Herbst and Stefanie Jegelka.
International Conference on Learning Representations (ICLR), 2025 **(Spotlight)**.
Also: NeurReps Workshop at NeurIPS 2024.

[2] **Spatio-Spectral Graph Neural Networks.** ⏦ ⏺
Simon Geisler*, Arthur Kosmala*, Daniel Herbst, and Stephan Günnemann.
Advances in Neural Information Processing Systems (NeurIPS), 2024.
Also: LCFM Workshop at ICML 2024, LoG Conference 2024.

* Equal contribution.

SERVICE

Organizing	Co-organizer of the *New in ML Workshop* at NeurIPS 2024.
Reviewing	· ICLR 2025 Conference.
	· NeurIPS 2024 *Workshop on Symmetry and Geometry in Neural Representations*.
	· NeurIPS 2024 *Workshop on Causality and Large Models*.

SKILLS

Spoken Languages	German (native), English (C2), Spanish (C1).
Programming Languages	Python, Java, C++, R, Matlab.
Further Technologies	NumPy, SciPy, Pandas, Scikit-Learn, PyTorch, JAX, SQL, LaTeX, Git.

MISCELLANEOUS

German Academic Scholarship Foundation   06/2019 – 07/2023
Ambassador, Head of Ambassadors   *Karlsruhe and Munich, Germany*

Organized information events, scholarship fairs and school visits; managed a team of 20 ambassadors in Karlsruhe, developed a nation-wide strategy for online information events and school visits during the pandemic.