

# Semih Cayci

Junior Professor for Mathematics of Machine Learning · RWTH Aachen University

Selected academic CV · October 2026

Pontdriesch 14-16, 52062 Aachen, Germany

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## Research interests

Mathematical foundations of artificial intelligence: deep learning and reinforcement learning, optimization theory, and applied stochastic analysis.

## Academic and research appointments

- |                   |                                                                                                                                                                                                                                                                           |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2022-10 - Present | <b>Tenure-Track Junior Professor (W1) for Mathematics of Machine Learning</b><br>RWTH Aachen University · Aachen, Germany<br>Department of Mathematics. Positive interim evaluation in 2025.                                                                              |
| 2020-08 - 2022-08 | <b>NSF TRIPODS Postdoctoral Fellow</b><br>University of Illinois at Urbana-Champaign · Urbana, IL, USA<br>Coordinated Science Laboratory; Illinois Institute for Data Science and Dynamical Systems (IDS2).<br>Hosts: Rayadurgam Srikant (UIUC) and Niao He (ETH Zurich). |
| 2017-06 - 2017-09 | <b>Intern Scientist</b><br>Mitsubishi Electric Research Laboratories (MERL) · Cambridge, MA, USA<br>Host: Toshiaki Koike-Akino.                                                                                                                                           |

## Education

- |             |                                                                                                                                                                                                                              |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2014 - 2020 | <b>PhD in Electrical and Computer Engineering</b><br>The Ohio State University · Columbus, OH, USA<br>Dissertation: Online Learning for Optimal Control of Communication and Computing Systems.<br>Advisor: Atilla Eryilmaz. |
| 2010 - 2013 | <b>MSc in Electrical and Electronics Engineering</b><br>Bilkent University · Ankara, Turkey<br>Thesis: Lossless Data Compression with Polar Codes.<br>Advisors: Erdal Arıkan and Orhan Arıkan.                               |
| 2005 - 2010 | <b>BSc in Electrical and Electronics Engineering</b><br>Bogazici University · Istanbul, Turkey                                                                                                                               |

## Research grants

**2026-2027** · NVIDIA Academic Grant: GPU-Accelerated Benchmarking of Learning-Based Routing under Heavy Tails. PI: Semih Cayci. Two NVIDIA DGX Spark systems.

**2024-2025** · ERS, RWTH Aachen: Mathematical and Practical Properties of Policy-Based Reinforcement Learning (OPSF854). Co-PIs: Semih Cayci and Sebastian Trimpe.

# Semih Cayci

Teaching, supervision, and academic service

## Teaching

At RWTH Aachen: Mathematical Foundations of Machine Learning (Winter 2025/26); Mathematical Foundations of Reinforcement Learning (Winter 2022/23, Summer 2025, Winter 2026/27); Stochastic Analysis (Winter 2024/25); Mathematical Foundations of Deep Learning (Winter 2023/24, Summer 2026).

Planned: Higher Mathematics for Mechanical Engineers, in German (Winter 2027/28).

## Research supervision

**PhD:** Reza Zolnouri (since 2025). **Former postdoctoral researcher:** Johannes Müller (2023-2024; subsequently TU Berlin).

**Master's supervision:** Xinyi Sheng, Jonas Nießen, Xingguang Zhou, Yang Yang (2024); Reza Zolnouri, Jiaan Xing (2025); Steve Meiter, Mariia Krasilnikova (2026).

**Doctoral mentoring:** Enes Arda (Ohio State, since 2025); Ali Batuhan Yardim (ETH Zurich, 2022-2023); Yilin Zheng (Ohio State, 2019-2024).

## Professional service

**Organization:** Publicity chair, ACM SIGMETRICS 2026 and 2027; publicity co-chair, IEEE WiOpt 2026.

**Program committees:** IEEE INFOCOM 2027; AAAI 2026 and 2027; ACM MobiHoc 2025; COLT 2022; IEEE WiOpt 2021.

**University service:** Hiring committees for W2 Professorships in Mathematical Optimization and Industrial Mathematics, RWTH Aachen University.

**Reviewing:** JMLR; SIAM journals on Control and Optimization and Mathematics of Data Science; Mathematics of Operations Research; ICML; NeurIPS; AISTATS; ICLR; COLT, among others.

## Selected awards and fellowships

**2026** · NVIDIA Academic Grant.

**2020** · NSF TRIPODS Postdoctoral Fellowship, University of Illinois at Urbana-Champaign.

**2016** · Dr. Burn Lin Travel Grant Award, The Ohio State University.

**2010-2014** · Bilkent University Graduate School Scholarship.

**2005-2010** · Turkish Ministry of Education Merit Scholarship.

## Selected invited lectures

**June 2026** · Policy Gradient Methods. Reinforcement Learning Summer School, Milan.

**March 2024** · Towards Robust and Sample-Efficient Reinforcement Learning Using Policy Optimization. Airbus Operations, Hamburg.

**May 2023** · Theoretical Aspects of Deep Learning. SFB 1481 Spring School, Kloster Steinfeld.

## Memberships

ELLIS and ELLIS NRW; RWTH Center for Artificial Intelligence; SFB 1481: Sparsity and Singular Structures; EDDy Research and Teaching Group.

Publication list and BibTeX: [semihcayci.github.io/publications/](https://semihcayci.github.io/publications/)