

Emanuel Tewolde

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SELECTED EDUCATION

Carnegie Mellon University

PhD in Computer Science

Aug. 2022 – ca. Sep. 2027

Pittsburgh, USA

- Foundations of Cooperative AI Lab (FOCAL), Advisor: Vincent Conitzer
- Focus: Algorithmic Game Theory for Agentic AI, LLM Agents, Reinforcement Learning

Carnegie Mellon University

MSc in Computer Science — (research-focused Master's)

Aug. 2022 – May 2025

Pittsburgh, USA

Imperial College London

MSc in Pure Mathematics

Oct. 2020 – Oct. 2021

London, United Kingdom

- GPA (UK): 83.8%, Distinction → Ranked 1st out of 28 Graduates
- Focus: Geometry & Topology, Game Theory, Machine Learning

Technical University (TU) of Darmstadt

BSc in Mathematics with a minor in Economics

Oct. 2016 – Oct. 2019

Darmstadt, Germany

- GPA (Germany): 1,27
- Focus: Mathematical Optimization

INDUSTRY AND RESEARCH EXPERIENCES

Meta (contracting via Magnit)

Research Engineer at FAIR within Meta Superintelligence Labs

Sep. 2025 – Dec. 2025

London, United Kingdom

- Contributed to LLM Coding Agents for AI Research (AIRA) by designing ML research tasks, spearheading the integration of RL and Game Theory environments, and conducting large-scale evaluations of agent capabilities.

Carnegie Mellon University

Graduate Research Assistance, Working on Cooperative AI Research

Aug. 2022 – ca. May 2027

Oxford, United Kingdom

University of Oxford

Extended Research Visits, Working on Cooperative AI Research

Summers of 2022–2025

Oxford, United Kingdom

Fraunhofer Institute for Energy Economics and Energy System Technology

Research Internship

Apr. 2020 – Jul. 2020

Kassel, Germany

- Worked on Deep Learning on Graphs representing Energy Distribution Networks

Fraunhofer Institute for Energy Economics and Energy System Technology

Undergraduate Research Assistance

May 2019 – Oct. 2019 resp.

Kassel, Germany

- Worked on Machine Learning Methods for Time Series Data representing Wind Turbine Maintenance Data

SELECTED SCHOLARSHIPS, GRANTS, AND AWARDS

- AAI Best Poster Award (out of 674 posters) 2025
- PhD Fellowship, Cooperative AI Foundation 2025 – present
- Research Grant, Cooperative AI Foundation, \$6750 2022
- Scholarship, German Scholarship Foundation (Studienstift. des Deutschen Volkes), ~22,000€ 2020 – 2022
- Scholarship, Hessen-Wisconsin Exchange Program, ~\$10,000 2018

PUBLICATIONS

($\alpha\beta$) : alphabetical ordering, = : equal contribution, + : equal contribution

Working Papers

- Akash Kundu⁼, Emanuel Tewolde⁼, Ratip Emin Berker, Sam F. Brown, Vincent Conitzer. Do LLMs Take Care of Their Own? Similarity Signals Can Induce Cooperation. *In Submission*.
- Claire Jin, Andy Liu, Emanuel Tewolde, Vincent Conitzer. Evaluating Strategic Reasoning in LLMs in Simulation-Augmented Trust Games. *In Submission*.
- Jiayuan Liu⁼, Tianqin Li⁼, Shiyi Du⁼, Xin Luo⁼, Haoxuan Zeng, Emanuel Tewolde, Tai Sing Lee, Tonghan Wang, Carl Kingsford, Vincent Conitzer. The Memory Curse: How Expanded Recall Erodes Cooperative Intent in LLM Agents. *In Submission*.
- Emanuel Tewolde, Brian Hu Zhang, Ioannis Anagnostides, Tuomas Sandholm, Vincent Conitzer. Decision Making under Imperfect Recall: Algorithms and Benchmarks. *In Submission*.
- Alisia Lupidi⁼, Bhavul Gauri⁼, Thomas Simon Foster⁼, Bassel Al Omari⁼, Despoina Magka⁼, ... (11 more authors) ..., Emanuel Tewolde, ... (18 more authors) ..., Jakob Foerster, Yoram Bachrach. AIRS-Bench: a Suite of Tasks for Frontier AI Research Science Agents.
- Alexis Audran-Reiss, Jordi Armengol-Estapé, ... (12 more authors) ..., Emanuel Tewolde, ... (3 more authors) ..., Tatiana Shavrina, Yoram Bachrach. What Does It Take to Be a Good AI Research Agent? Studying the Role of Ideation Diversity.
- Steffen Backmann, David Guzman Piedrahita, Emanuel Tewolde, Rada Mihalcea, Bernhard Schölkopf, Zhijing Jin. When Ethics and Payoffs Diverge: LLM Agents in Morally Charged Social Dilemmas. *In Submission*.

Highly Refereed Conference Papers

- ($\alpha\beta$) Ioannis Anagnostides, Maria-Florina Balcan, Kiriaki Fragkia, Tuomas Sandholm, Emanuel Tewolde, Brian Hu Zhang. The Complexity of Equilibrium Refinements in Potential Games. In *ACM Conference on Economics and Computation (EC)*, 2026.
- Emanuel Tewolde⁼, Xiao Zhang⁼, David Guzman Piedrahita, Vincent Conitzer⁺, Zhijing Jin⁺. CoopEval: Benchmarking Cooperation-Sustaining Mechanisms and LLM Agents in Social Dilemmas. In *International Conference on Machine Learning (ICML)*, 2026.
- Ioannis Anagnostides, Emanuel Tewolde, Brian Hu Zhang, Ioannis Panageas, Tuomas Sandholm, Vincent Conitzer. Convergence of Regret Matching in Potential Games and Constrained Optimization. In *International Conference on Learning Representations (ICLR)*, 2026.
- Ratip Emin Berker⁼, Emanuel Tewolde⁼, Vincent Conitzer, Mingyu Guo, Marijn Heule, Lirong Xia. On the Edge of Core (Non-)Emptiness: An Automated Reasoning Approach to Approval-Based Multi-Winner Voting. In *Association for the Advancement of Artificial Intelligence (AAAI)*, **Oral**, 2026.
- Chandler Smith, Marwa Abdulhai, ... (15 more authors) ..., Emanuel Tewolde, ... (66 more authors) ..., Jose Hernandez-Orallo, Joel Z Leibo. Evaluating Generalization Capabilities of LLM-Based Agents in Mixed-Motive Scenarios Using Concordia. In *Neural Information Processing Systems (NeurIPS) – Datasets and Benchmarks Track*, 2025.
- Brian Hu Zhang⁼, Ioannis Anagnostides⁼, Emanuel Tewolde, Ratip Emin Berker, Gabriele Farina, Vincent Conitzer, and Tuomas Sandholm. Learning and Computation of Φ -Equilibria at the Frontier of Tractability. In *ACM Conference on Economics and Computation (EC)*, 2025.
- Brian Hu Zhang⁼, Ioannis Anagnostides⁼, Emanuel Tewolde, Ratip Emin Berker, Gabriele Farina, Vincent Conitzer, and Tuomas Sandholm. Expected Variational Inequalities. In *International Conference on Machine Learning (ICML)*, **Oral** (Top 1.0% of submissions), 2025.
- Emanuel Tewolde, Brian Hu Zhang, Caspar Oesterheld, Tuomas Sandholm, and Vincent Conitzer. Computing Game Symmetries and Equilibria That Respect Them. In *Association for the Advancement of Artificial Intelligence (AAAI)*, **Oral** (Top 4.6% of submissions), 2025. **Best Poster Award** (out of 674 posters).
- Ratip Emin Berker, Emanuel Tewolde, Ioannis Anagnostides, Tuomas Sandholm, Vincent Conitzer. The Value of Recall in Extensive-Form Games. In *Association for the Advancement of Artificial Intelligence (AAAI)*, **Oral**, 2025.
- Emanuel Tewolde, Brian Hu Zhang, Caspar Oesterheld, Manolis Zampetakis, Tuomas Sandholm, Paul W. Goldberg, and Vincent Conitzer. Imperfect-Recall Games: Equilibrium Concepts and Their Complexity. In *International Joint Conference on Artificial Intelligence (IJCAI)*, 2024.
- Emanuel Tewolde and Vincent Conitzer. Game Transformations That Preserve Nash Equilibria or Best-Response Sets. In *International Joint Conference on Artificial Intelligence (IJCAI)*, 2024.

- ($\alpha\beta$) Vincent Conitzer, Rachel Freedman, Jobst Heitzig, Wesley H. Holliday, Bob M. Jacobs, Nathan Lambert, Milan Mossé, Eric Pacuit, Stuart Russell, Hailey Schoelkopf, Emanuel Tewelde, and William S. Zwicker. Social Choice Should Guide AI Alignment in Dealing with Diverse Human Feedback. In *International Conference on Machine Learning (ICML) – Position Paper Track*, 2024.
- Emanuel Tewelde, Caspar Oesterheld, Vincent Conitzer, and Paul Goldberg. The Computational Complexity of Single-Player Imperfect-Recall Games. In *International Joint Conference on Artificial Intelligence (IJCAI)*, 2023.

TEACHING EXPERIENCE

- Leading a Reading Group for the Cooperative AI Summer School 2025
- Graduate Teaching Assistant, Carnegie Mellon University 2024 – 2025
Sole TA for 15-784 Cooperative AI and 17-759 Advanced Topics in Machine Learning and Game Theory
- Instructor for new Teaching Assistants, TU of Darmstadt 2019 – 2020
Taught and supervised 5 – 10 new TAs per semester for the mathematics department
- Undergraduate Teaching Assistant, TU of Darmstadt 2017 – 2019
Introduction to Algebra, Analysis 2, Analysis 1

RELEVANT SKILLS

Software: Python ★★★★★, High-Performance & Distributed Computing ★★★★★, PyTorch ★★★★★, TensorFlow ★★★★★, Gym ★★★★★, Matlab ★★★★★, SQL ★★★★★, Microsoft Office ★★★★★
 Languages: German ★★★★★, English ★★★★★, Amharic ★★★★★

Research Mentorship

- Akash Kundu, Undergrad at Heritage Institute of Technology 2026 – ongoing
- Xiao Zhang, Undergrad at UToronto → SWE at Google 2025 – 2026

INVITED TALKS

- Google DeepMind London June 2026
- Kaiqing Zhang's lab, University of Maryland, College Park Mar. 2026
- EconCS Seminar, Carnegie Mellon University Feb. 2026
- CAIRF Retreat, AI Safety South Africa Feb. 2026
- FAIR Meta London Dec. 2025
- Distributed AI Seminar, Kings College London Dec. 2025
- Autonomous Reasoning & Learning Group, Imperial College London Jul. 2025
- Optimization Seminar, Technical University of Darmstadt Jun. 2025
- EconCS Seminar, Carnegie Mellon University Feb. 2025
- FAR.AI Nov. 2024
- Guest Lecture for 17-759 Adv. Top. in Machine Learning and Game Theory, Carnegie Mellon University Nov. 2024
- Foundation and Language Model (FLAME) Center, Carnegie Mellon University Sep. 2024
- Algorithmic Game Theory Seminar, University of Oxford Jun. 2024
- Google DeepMind London May 2024
- Fei Fang's AI and Social Good Lab, Carnegie Mellon University Apr. 2024

FURTHER HIGHER EDUCATION

- Multiple Courses of the MSc in International Economics & Economic Policy at Goethe University Frankfurt 2019 – 2020
- MSc Specialization in Mathematical Optimization at the Technical University of Darmstadt 2019 – 2020
- Exchange Semester at the University of Wisconsin-Milwaukee 2018
- Taking a Mathematics Course at Goethe University Frankfurt as a High School Student 2015

SELECTED VOLUNTEERING

- Mentoring (non-research) of more junior PhD students at Carnegie Mellon University 2023 – present
- Co-organizing the visiting days and introductory course for admitted and first-year PhD students resp. 2023 – present
- Academic Representative for Pure Mathematics at Imperial College London 2020 – 2021
- Coordinating Outreach Events for the International Office at the TU of Darmstadt 2019 – 2020
- Hessen-Student-Ambassador in Milwaukee 2018