

# Emanuel Tewolde

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## SELECTED EDUCATION

### Carnegie Mellon University

Aug. 2022 – ca. Aug. 2027

*PhD in Computer Science*

Pittsburgh, USA

- Foundations of Cooperative AI Lab (FOCAL), Advisor: Vincent Conitzer
- Research Focus: Algorithmic Game Theory for AI systems
- Course Focus: Algorithmic Game Theory, Reinforcement Learning

### Imperial College London

Oct. 2020 – Oct. 2021

*MSc in Pure Mathematics*

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

Oct. 2016 – Oct. 2019

*BSc in Mathematics with a minor in Economics*

Darmstadt, Germany

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

## RESEARCH EXPERIENCE

- Research Assistance, On Cooperative AI, Carnegie Mellon University Aug. 2022 – ca. Aug. 2027
- Research Visits, On Cooperative AI, University of Oxford Summer 2022, 2023 & 2024
- Research Internship, On Deep Learning for Energy Distribution Networks, Fraunhofer Institute for Energy Economics and Energy System Technology (Fraunhofer IEE) Apr. 2020 – Jul. 2020
- Research Assistance, On Machine Learning for Wind Turbine Maintenance, Fraunhofer IEE May 2019 – Oct. 2019

## PUBLICATIONS

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

### In Submission

- Brian Hu Zhang\*, Ioannis Anagnostides\*, Emanuel Tewolde, Ratip Emin Berker, Gabriele Farina, Vincent Conitzer, and Tuomas Sandholm. Learning and Computation of  $\Phi$ -Equilibria at the Frontier of Tractability.
- Brian Hu Zhang\*, Ioannis Anagnostides\*, Emanuel Tewolde, Ratip Emin Berker, Gabriele Farina, Vincent Conitzer, and Tuomas Sandholm. Expected Variational Inequalities.

### Highly Refereed Conference Papers

- 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**, 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 Tewolde, 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 Tewolde, 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.

## SELECTED SCHOLARSHIPS, GRANTS, AND AWARDS

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- AAAI 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

## TEACHING EXPERIENCE

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- 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

## INVITED TALKS

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- 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

## RELEVANT SKILLS

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Software: Python ★★★★★, Matlab ★★☆☆, SQL ★★☆☆, Microsoft Office ★★★★★  
Libraries: PyTorch ★★★★★, TensorFlow ★★★★★, Gym ★★★★★  
Languages: German ★★★★★, English ★★★★★, Amharic ★★☆☆

## FURTHER HIGHER EDUCATION

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- 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

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- Mentoring 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