

Matthias Dellago

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Publications

Characterising 0-day exploit brokers, *Matthias Dellago, Daniel Woods, Andrew Simpson*, Workshop on the Economics of Information Security, 2022.

Invited to present findings to Google Chrome Security Team.

Exploit brokers and offensive cyber operations, *Matthias Dellago, Daniel Woods, Andrew Simpson*, *The Cyber Defense Review*, 2022.

Formalising attack trees to support economic analysis, *Andrew Simpson, Matthias Dellago, Daniel Woods*, *The Computer Journal*, 2022.

Awards and Recognitions

2023-2024 **Long Term Future Fund Grantee**, *Effective Altruism Fund*, Technical AI-alignment research: A new approach to mechanistic interpretability of attention, based on modern Hopfield networks and statistical physics.

Experience

- Currently **Visiting Member**, *London Initiative for Safe AI*.
Grounding deep learning in algorithmic information theory, connecting to singular learning theory.
- 2024 **Guest Researcher**, *Institute for Machine Learning*, Johannes Kepler University Linz.
Interpretability of attention – weight decay and sparsity. Loss landscape analysis.
- Winter 2023 **Guest Researcher**, *Amsterdam Machine Learning Lab*, University of Amsterdam.
Interpretability of attention, and new interpretable architectures.
- 2021-2022 **Researcher**, *Information Security and Privacy Lab*, University of Innsbruck.
Joint project with Oxford University: Combining Exploit Market Data with Attack Trees.
- 2020 **Instructor of Undergraduate Mathematics for Economics Exercise Class**, *Department of Statistics*, University of Innsbruck.
- Summer 2018 **Lab Assistant**, *Institute for High Energy Physics*, Austrian Academy of Sciences.
Measured and approved detectors for use at CERN.
- 2018 **Teaching Assistant for Introductory Physics Course**, University of Vienna.

Education

- Currently **Master's Thesis with Erasmus Scholarship**, *Amsterdam Machine Learning Lab*.
- June 2023 **ML Alignment Theory Scholars Program**, *Stanford Existential Risks Initiative*.
Wentworth Track: 6-week workshop on AI-risks, problem solving and scientific writing.
- 2022 **Exchange Program**, *Vrije Universiteit Amsterdam*.
Software reverse engineering and machine learning on graphs.
- 2020-Present **Computer Science Master's Studies**, *University of Innsbruck*.
Focus on machine learning and information security.

- 2019-2020 **Physics Master's Studies**, *University of Innsbruck*.
Focus on adiabatic quantum computation. Switched to computer science in 2020.
- 2015-2019 **Physics BSc**, *University of Vienna*.
Designed and built a cloud chamber to win a competition for muon (cosmic ray) detection.
- 2007-2015 **Gymnasium**, *Krottenbachstraße*, Vienna.
English-German bilingual high school. Graduation with perfect score.

■ Languages

German Native
English Near-Native
French Maladroit

■ Other Interests

Competed in swimming, triathlon, cross country skiing and judo. Currently also mountaineering.