

# Paul Friedrich

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🌐 pfriedric.github.io

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🌐 Paul Friedrich

## Education

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- 2020 – current      **Ph.D. in Computer Science** at University of Zurich  
Advised by Prof. Sven Seuken and Prof. Giorgia Ramponi
- 2017 – 2020      **M.Sc. in Mathematics** at ETH Zurich  
Thesis: *A Machine Learning Perspective on the Kyle Model*  
Supervised by Prof. Josef Teichmann, graded 6/6
- 2017      **Exchange semester** at the Hong Kong University of Science and Technology
- 2014 – 2018      **B.Sc. in Mathematics** at ETH Zurich  
Thesis: *Risk Measures and their Applications: an Exposition*  
Supervised by Prof. Mete Soner, graded 6/6

## Working Experience

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- 01/2020 – 09/2020      **Consultant**  
Ernst & Young (Zurich)  
Quant & Analytics, Financial Services Risk Management  
*Regulatory & financial audits of, and advisory projects for, globally active Swiss financial institutions. Audited statistical and scenario-based risk models, critically verified documentation, designed and implemented independent challenger models in Python and R.*
- 09/2018 – 03/2019      **Intern**  
Ernst & Young (Zurich)  
Quant & Analytics, Financial Services Risk Management

## Research Papers

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**Paul Friedrich**, Yulun Zhang, Michael J. Curry, Ludwig Dierks, Stephen McAleer, Jiaoyang Li, Tuomas Sandholm, and Sven Seuken, “Scalable mechanism design for multi-agent path finding,” *preprint at arXiv:2010.06398*, 2024.

**Paul Friedrich**, Ludwig Dierks, and Sven Seuken, “Machine learning-enhanced market design for drone traffic management,” *working paper*, 2024.

Sven Seuken, **Paul Friedrich**, and Ludwig Dierks, “Market design for drone traffic management,” *AAAI Conference on Artificial Intelligence*, won *Blue Sky Best Paper Award* (third place), 2022.

**Paul Friedrich** and Josef Teichmann, “Deep investing in kyle’s single period model,” *preprint at arXiv:2006.13889*, 2020.

## Professional Experience

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### Supervisory Roles

- 2021 – 2022      **Master’s project** at University of Zurich. *Supervised a team of MSc students at UZH who developed a simulator for drone traffic management as part of my line of research. Students: Joel Barmettler, Thomas Mannhart, Johann Schwabe.*

## Professional Experience (continued)

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### Volunteering Roles

- 2017 – 2018      **Organising committee** of the yearly Math & Physics job fair *MindPhair* at ETH Zurich.
- 2015 – 2016      **Board member for university's policy** in the Association of Mathematics and Physics students at ETH Zurich. *Handled all communication between the association and the Department of Mathematics at ETH, represented student interests in all department committees, incl. hiring committees. Organised events, coordinated with other student associations.*

### Teaching Roles

- 2021 & 2022      **Head Teaching Assistant** at University of Zurich. Coordinated TAs, weekly exercise sheets and final exam for the CompSci BSc/MSc lecture *Algorithmic Game Theory and Mechanism Design*
- 2020 & 2023      **Teaching Assistant** at University of Zurich for the CompSci BSc/MSc lecture *Algorithmic Game Theory and Mechanism Design*
- 2016 – 2018      **Teaching Assistant** at ETH Zurich for the Mathematics BSc lectures *Topology, Complex Analysis, Real Analysis I*

### Competitions

- 2023      **1st Computational Social Choice Competition** at IJCAI '2023.  
*Won 2nd place (with B. Pasztor and E. Soumalias). Macao S.A.R.*

### Conferences and Summer Schools

- 2022      23rd ACM Conference on Economics and Computation (**EC'22**).  
*Boulder, USA.*
- 36th AAAI Conference on Artificial Intelligence (**AAAI-22**).  
*Vancouver, Canada.*
- 2021      **Summer School:** Data Science, Optimization and Operations Research.  
*Organised by Prof. Michel Bierlaire, EPFL Lausanne. Zinal, Switzerland.*
- 22nd ACM Conference on Economics and Computation (**EC'21**).  
*Budapest, Hungary.*

## Skills

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|--------------------|---|
| Coding             | <b>Python (daily use)</b> , R, MATLAB, C++.   |
| Tools & Frameworks | Numpy/Scipy, JAX, Keras, PyTorch, Gurobi, CPLEX, SQL.   |
| Languages          | German (mothertongue), English (proficient), French (fluent), Spanish (intermediate). Basic Russian, Ukrainian, Mandarin Chinese. |
| Interests          | Sports (triathlon, sailing, surfing), Volunteering, Cooking, Traveling & Cultural exchange, Violin, Language learning.            |