

Ludwig Dierks

Information and Decision Sciences
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Research Fields

Primary Market Design
Secondary Revenue Management, Operations Management, Artificial Intelligence

Education

- 02.2016-04.2021 **Ph.D. Informatics**, Faculty of Economics, Business Administration and Informatics; University of Zurich, Switzerland
"Market Design for Cloud Computing and Software Markets", Grade: 'summa cum laude', Defense Date: 18.01.2021, Advisor: Sven Seuken
- 10.2012-06.2015 **M.Sc. Mathematics in Operations Research**, Department of Mathematics; Technical University of Munich, Germany
Cooperative Game Theory, Combinatorial Optimization, Advisor: Felix Brandt
- 10.2009-09.2012 **B.Sc. Mathematics**, Department of Mathematics; Technical University of Munich, Germany

Research Internships, Summer Schools, etc.

- 06.2018-09.2018 **Research Intern**, Microsoft Office of the Chief Economist, U.S.A
Mentor: Jacob La'Riviere
- 06.2017-06.2017 **Student Visitor**, Microsoft Research Cambridge, Great Britain
- 07.2016-07.2016 **Microsoft Research Summer School**, Microsoft Research Cambridge, Great Britain
- 10.2012-08.2013 **Exchange Student**, National Cheng Kung University, Taiwan (R.O.C.)
Advisor: Prof. Ruey-Lin Sheu

Employment History

- 08.2023-now **Assistant Professor (Tenure Track)**, University of Illinois at Chicago, Chicago, USA
Department of Information and Decision Sciences
- 05.2022-07.2023 **SNSF PostDoc.Mobility Fellow**, Kyushu University, Fukuoka, Japan
Multi-Agent Laboratory under Makoto Yokoo
- 06.2021-04.2022 **Postdoctoral Researcher**, University of Zurich (60%) and Kyushu University (40%), Zurich, Switzerland
Computation and Economics Research Group under Sven Seuken and Multi-Agent Laboratory under Makoto Yokoo
- 03.2021-05.2021 **Postdoctoral Researcher**, University of Zurich, Zurich, Switzerland
Computation and Economics Research Group under Sven Seuken

- 10.2015-02.2021 **Ph.D. Student**, *University Zurich*, Zurich, Switzerland
Computation and Economics Research Group under Sven Seuken
- 06.2018-09.2018 **Research Intern**, *Microsoft Office of the Chief Economist*, Redmond, U.S.A
Under Jacob La'Riviere
- 11.2013-09.2014 **Working Student**, *Berner & Mattner*, Munich, Germany
- 03.2012-04.2012 **Intern**, *iic engineers (now mosaic)*, Munich, Germany
- 10.2011-03.2012 **Student Assistant**, *TUM*, Munich, Germany

Prizes, Awards, Fellowship

- 2022-2023 SNSF PostDoc.Mobility Fellowship; Starting date: 01.05.22, Duration 2 Years (Voluntarily Terminated Early to Join UIC); Amount: CHF 104,000
- 2022 AAI Blue Sky Best Paper Award, 3rd place for 'Market Design for Drone Traffic Management'

Peer-reviewed Journal Publications

Ludwig Dierks and Sven Seuken (2022) *Cloud Pricing: The Spot Market Strikes Back*. In **Management Science** 68(1):105-122, Previously appeared as a 1-page extended abstract at EC'19;

Ludwig Dierks, Ian Kash and Sven Seuken (2021) *On the cluster admission problem for cloud computing*. In **Journal of Artificial Intelligence Research (JAIR)** 71(2021): 1-40; Previously appeared as a 6-page extended abstract at NetEcon'19;

Peer-reviewed Conference and Workshop Publications

Ludwig Dierks and Makoto Yokoo *When Should Prices Stay Fixed? On the Chances and Limitations of Spot Pricing in Larger Markets*. (SIGMETRICS'24, forthcoming)

Bo You, Ludwig Dierks, Taiki Todo, Minming Li and Makoto Yokoo (2022) *Strategy-Proof House Allocation with Existing Tenants over Social Networks*. In **Proceedings of the 21th International Conference on Autonomous Agents and Multiagent Systems (AAMAS'22)**;

Sven Seuken, Paul Friedrich and Ludwig Dierks (2022) *Market Design for Drone Traffic Management*. In **Proceedings of the Thirty-Sixth AAI Conference on Artificial Intelligence (AAAI'22)**;

Ludwig Dierks and Sven Seuken (2020) *The Competitive Effects of Variance-based Pricing*. In **Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence (IJCAI'20)**;

Ludwig Dierks and Sven Seuken (2019) *Cloud Pricing: The Spot Market Strikes Back*. In **Proceedings of the 20th ACM Conference on Economics and Computation (EC'19)**; Extended Abstract (full version in Management Science);

Ludwig Dierks, Ian Kash and Sven Seuken (2019) *On the cluster admission problem for cloud computing*. In **Proceedings of the 14th Workshop on the Economics of Networks (NetEcon'19)**; 6-page Extended Abstract (full version in JAIR);

Public Working Papers

Nils Olberg, Ludwig Dierks, Sven Seuken, Vincent Slaugh and Utku Ünver (2022) *Search and Matching for Adoption from Foster Care*.

Ludwig Dierks and Sven Seuken (2020) *Revenue Maximization for Consumer Software: Subscription or Perpetual License?*.

Unpublished Work (Under Review or In Preparation for Submission)

Ludwig Dierks, Makoto Yokoo *Information Goods: Externality-Based Upgrades and Income Effects*.

Paul Friedrich, Yulun Zhang, Michael Curry, Ludwig Dierks, Stephen McAleer, Jiaoyang Li, Tuomas Sandholm, Sven Seuken *Scalable Mechanism Design for Multi-Agent Path Finding*.

Ludwig Dierks, Jacob LaRiviere, Aadharsh Kannan, and Thomas Moscibroda *Efficiency Gains from Flexible Scheduling Policies in the Cloud*.

Ludwig Dierks and Sven Seuken *Export Restrictions in the Face of COVID-19: A Game-Theoretic Analysis of Global Demand Shocks*.

Ludwig Dierks, Vincent Slauch and Utku Ünver *Adoption Platform Design to Improve Outcomes for Children with Disabilities*.

Ludwig Dierks, Jacob LaRiviere, Aadharsh Kannan, and Thomas Moscibroda *Efficiency Gains from Flexible Scheduling Policies in the Cloud*.

Contributions to Conferences

- 17/10/2023 Invited Talk "Assignment-Delay Mechanisms for UAV Airspace Assignment"; *Inform's Annual Meeting 2023*; Phoenix, USA
- 09/07/2023 Poster "Information Goods: Externality-Based Upgrades and Income Effects"; *24th ACM Conference on Economics and Computation*; London, GB
- 18/10/2022 Talk "When Prices Should Stay Fixed: On The Limitations of Spot Pricing in Larger Markets"; *Inform's Annual Meeting 2021*; Indianapolis, USA
- 25/10/2021 Invited Talk "Revenue Maximization for Consumer Software: Subscription or Perpetual License?"; *Inform's Annual Meeting 2021*; Virtual
- 22/07/2021 Talk "Export Restrictions in the Face of COVID-19: A Game-Theoretic Analysis of Global Demand Shocks"; *6th World Congress of the Game Theory Society*; Budapest, Hungary (Virtual)
- 22/07/2021 Talk "The Competitive Effects Of Variance-based Pricing"; *6th World Congress of the Game Theory Society*; Budapest, Hungary (Virtual)
- 01/14/2020 Poster "The Competitive Effects Of Variance-based Pricing"; *29th International Joint Conference on Artificial Intelligence*; Yokohama, Japan (Virtual)
- 01/14/2020 Talk "The Competitive Effects Of Variance-based Pricing"; *29th International Joint Conference on Artificial Intelligence*; Yokohama, Japan (Virtual)
- 11/09/2020 Invited Talk "The Competitive Effects Of Variance-based Pricing"; *Inform's Annual Meeting 2020*; Virtual
- 10/20/2019 Invited Talk "Cloud Pricing: The Spot Market Strikes Back"; *Inform's Annual Meeting 2019*; Seattle, Washington, USA
- 06/28/2019 Talk "On the cluster admission problem for cloud computing"; *The 14th Workshop on the Economics of Networks, Systems and Computation*; Phoenix, Arizona, USA

- 06/26/2019 Talk "Cloud Pricing: The Spot Market Strikes Back"; *20th ACM Conference on Economics and Computation*; Phoenix, Arizona, USA, Recording: <https://youtu.be/3EK5ldZppSM>
- 11/04/2018 Invited Talk "The Power of Machine Learning and Market Design for Cloud Computing Admission Control"; *INFORMS Annual Meeting 2018*; Phoenix, Arizona, USA
- 07/25/2016 Poster "Cloud Pricing: The Spot Market Strikes Back"; *17th ACM Conference on Economics and Computation*; Maastricht, Netherlands
- 07/24/2016 Talk "Cloud Pricing: The Spot Market Strikes Back"; *Workshop on the Economics of Cloud Computing*; Maastricht, Netherlands

Supervision of Students (at UZH)

- 03.2021-08.2021 Thesis Supervision; Bachelor Thesis of Tim Ehrensperger
- 02.2019-07.2019 Thesis Supervision; Bachelor Thesis of David Lehnherr

Teaching Activities

At UIC

- 08.2023-12.2023 Lecturer; Lecture: Introduction to Operations Management
- 08.2021-01.2022 Lecturer; Lecture: Economics and Computation
- 08.2020-01.2021 Lecturer; Lecture: Economics and Computation
- 02.2019-07.2019 Teaching Assistant; Lecture: Market Design and Machine Learning
- 08.2018-01.2019 Teaching Assistant; Lecture: Economics and Computation
- 02.2018-07.2018 Teaching Assistant; Lecture: Market Design: Theory and Practice
- 08.2017-01.2018 Teaching Assistant; Lecture: Economics and Computation
- 08.2016-01.2017 Teaching Assistant; Lecture: Economics and Computation

At Technical University of Munich

- 10.2011-03.2012 Student Teaching Assistant; Lecture: Discrete Structures

Scientific Reviewing Activities

Program Committee:

AAAI'21, EC'22, AAAI'23, AAMAS'23, EC'23, AAMAS'24

Other reviews:

EC'16, EC'17, NetEcon'17, AAAI'18, Operations Research, EC'21, ACM Transactions on Economics and Computation, Naval Research Logistics, Autonomous Agents and Multi-Agent Systems, Production and Operations Management, IEEE Transactions on Services Computing, IEEE Transactions on Network and Service Management, European Journal of Operational Research

Active Memberships in Scientific Societies

Member: Game Theory Society; INFORMS (Auctions & Market Design Section); ACM SIGecom, American Economic Association

Personal Skills

Languages German (native), English (fluent)
Programming Languages Python (incl. Pandas), Java, Matlab, Mathematica, C++, R, Excel/VBA

Personal Information

Citizenship German
Languages German (native), English (fluent)