

Philipp Geiger

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Summary

Degrees Doctorate in **computer science**, diplom (~ MSc) in **mathematics**
Research **Modeling** via **machine learning**, **causal inference** (quasi-experiments, counterfactuals), **time series analysis** (demand forecasting); **multi-agent decision making** (game theory)
Application **Implementing** real-world system using **Python**, MySQL, in **collaboration** with engineers

Experience

04/2017 – **Postdoc researcher**
present **Max Planck Institute for Intelligent Systems**, Tübingen, Germany

- Leading research project Cafeteria Coordination, including a real-world sensor / demand forecasting / web app system for efficient usage of facilities by many agents
- Applying machine learning (Kalman filtering, exponential smoothing, ridge regression in Python, R, MySQL), game theory (best-response dynamics, truthfulness)
- Coordinating with software engineers, work councils, privacy officers, manufacturers

07/2015 – **Research intern**
10/2015 **Microsoft Research Ltd.**, Cambridge, United Kingdom

- Worked on AI research project in close collaboration with software engineers

Education

06/2013 – **Doctorate in computer science (equivalent to PhD)**
03/2017 **Max Planck Institute for Intelligent Systems**, Tübingen, and **University of Stuttgart**, Germany

- Thesis title: "Causal models for decision making via integrative inference"
- Grade: magna cum laude
- Supervisors: Bernhard Schölkopf, Dominik Janzing and Marc Toussaint
- Focused on time series, quasi-experiments, counterfactuals and decision making
- Applied Gaussian process regression and vector autoregressive processes to economic and cloud computing data (using Python, Matlab and R)

10/2006 – **Diplom in mathematics (equivalent to MSc)**
12/2012 **Heidelberg University** and **Humboldt University of Berlin**, Germany

- Thesis title: "Mutual Information and Gödel Incompleteness"
- Grade: 1.4 (best score 1.0 of 5.0)
- Specialization: mathematical logic, theoretical computer science; minor: philosophy

Publications

Peer-reviewed

- Geiger, P., Zhang, K., Gong, M., Janzing, D., & Schölkopf, B. (2015). Causal inference by identification of vector autoregressive processes with hidden components. In *Proceedings of the 32nd International Conference on Machine Learning (ICML 2015)*.
- Gong, M., Zhang, K., Schoelkopf, B., Tao, D., & Geiger, P. (2015). Discovering temporal causal relations from subsampled data. In *Proceedings of the 32nd International Conference on Machine Learning (ICML 2015)*.
- Geiger, P., Janzing, D., & Schölkopf, B. (2014). Estimating causal effects by bounding confounding. In *Proceedings of the 30th Conference on Uncertainty in Artificial Intelligence (UAI 2014)*.

- Preprints**
- Geiger, P., Carata, L., & Schoelkopf, B. (2016). Causal inference for cloud computing. *ArXiv Preprint ArXiv:1603.01581*.
 - Geiger, P., Hofmann, K., & Schölkopf, B. (2016). Experimental and causal view on information integration in autonomous agents. *ArXiv Preprint ArXiv:1606.04250*.
- Theses**
- Geiger, P. (2017). Causal models for decision making via integrative inference. PhD thesis.
 - Geiger, P. (2012). Mutual information and Gödel incompleteness. Diploma thesis.

Supervision, teaching and reviewing

- 10/2016 – **Supervisor**
03/2017
- Student: Claudius Proissl (University of Stuttgart); research project during MSc
- 10/2013 – **Teaching assistant**
02/2014
- University of Tübingen, Germany
- Lecture "Intelligent Systems I": a first course in machine learning
- 10/2011 – **Teaching assistant**
04/2012
- Heidelberg University, Germany
- Lecture "Computability and Computational Complexity Theory I"
- 10/2014 – **Reviewer**
present
- Conferences: NIPS 2014, ICML 2016, UAI 2016, NIPS 2016, ICML 2017, NIPS 2017
 - Journals: ACM Transactions on Intelligent Systems and Technology, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Knowledge and Data Engineering, International Journal of Data Science and Analytics

Skills

- Program-
ming**
- Machine learning (Gaussian process regression, ridge regression, Kalman filtering, exponential smoothing and vector autoregression) with Python (working knowledge), R and Matlab (basic knowledge)
 - Object-oriented programming with Python, C++ and Java (basic knowledge)
 - Web development with HTML, CSS (working knowledge), JavaScript, MySQL and web framework Django/Python (basic knowledge)
- Languages** German (native), English (fluent), French (beginner)

Memberships and awards

- 09/2015 – 06/2017 Associate Doctoral Fellow of Max Planck ETH Center for Learning Systems
- 07/2005 Award for outstanding results in physics by German Physical Society (DPG)

References

- Prof. Bernhard Schölkopf
- Department of Empirical Inference, Max Planck Institute for Intelligent Systems, Tübingen, Germany
- Relationship: PhD thesis co-supervisor
 - E-Mail: Sekretariat-Schoelkopf@tuebingen.mpg.de
- Dr. Katja Hofmann
- Microsoft Research Ltd., Cambridge, United Kingdom
- Relationship: Research internship supervisor
 - E-Mail: katja.hofmann@microsoft.com
- Dr. Wolfgang Merkle
- Institute for Computer Science, Heidelberg University, Germany
- Relationship: Diplom thesis supervisor
 - E-Mail: merkle@math.uni-heidelberg.de