Philipp Geiger

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Summary

Degrees	Doctorate in **computer science**, diplom (~ MSc) in **mathematics**; graded **"very good"**
Research	**Machine learning**, **causal inference**, **time series**, **multi-agent/economic decisions**
Application, teamwork	Implemented **congestion forecasting app**, **data-driven** debugging in **cloud computing**; using **Python, R, MySQL**; in **collaboration** with researchers and engineers

Experience

04/2017 – present
Postdoc researcher
Max Planck Institute for Intelligent Systems, Tübingen, Germany
- Leading research project on machine learning for efficient multi-agent facility usage
- Implemented congestion forecasting web app for campus cafeteria in Python, MySQL
- Applying game theory (Bayesian games, best-response dyn.), time series analysis (Kalman filtering, exponential smoothing, ridge regression, RNNs), data preprocessing
- Collaborating with researchers, software engineers, work councils, privacy officers

07/2015 – 10/2015
Research intern
Microsoft Research Ltd., Cambridge, United Kingdom
- Worked on AI simulation research project under Katja Hofmann

Education

06/2013 – 03/2017
Doctorate in computer science (equivalent to PhD)
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/"very good"
- Supervisors: Bernhard Schölkopf, Dominik Janzing and Marc Toussaint
- Focused on time series, quasi-experiments, counterfactuals and decision making
- Applied Gaussian process regression to debugging problems in cloud computing and vector autoregressive processes to economic data (using Python, Matlab and R)

10/2006 – 12/2012
Diplom in mathematics (equivalent to MSc)
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)/"very good"
- Specialization: mathematical logic, theoretical computer science; minor: philosophy

Selected 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., Winkelmann, J., Proissl, C., Besserve, M., & Schölkopf, B. (2018). Coordination via predictive assistants from a game-theoretic view. *ArXiv Preprint ArXiv:1803.06247*.
- Geiger, P., Carata, L., & Schoelkopf, B. (2016). Causal inference for cloud computing. *ArXiv Preprint ArXiv:1603.01581*.

Theses

- Geiger, P. (2017). Causal models for decision making via integrative inference. PhD thesis.
- Geiger, P. (2012). Mutual information and Gödel incompleteness. Diploma thesis.

Skills

Programming

- Machine learning implementation (Gaussian process regression, ridge regression, Kalman filtering, exponential smoothing, vector autoregression and neural networks) with Python (working knowledge), TensorFlow, R, Matlab and MySQL (basic)
- Object-oriented programming with Python (working knowledge), C++ (basic)

Communicating

- Presenting and explaining data, insights and results using PowerPoint, LaTeX, HTML
- Coordinating with diverse stakeholders from customers and manufacturers over researchers and software engineers to work councils and privacy officers
- Languages: German (native), English (fluent), French (beginner)

Supervision, teaching and reviewing

10/2016 – 03/2017 **Supervisor**

- Student: Claudius Proissl (University of Stuttgart); research project during MSc

10/2013 – 02/2014 **Teaching assistant**
University of Tübingen, Germany

- Lecture "Intelligent Systems I": a first course in machine learning

10/2011 – 04/2012 **Teaching assistant**
Heidelberg University, Germany

- Lecture "Computability and Computational Complexity Theory I"

10/2014 – present **Reviewer**

- Conferences: NIPS ('14, '17), ICML ('16, '17), UAI ('16, '17)
- Journals: ACM TIST, IEEE PAMI, IEEE TKDE, IJDSA

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
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
Heidelberg University, Germany

- Relationship: Diplom thesis supervisor
- E-Mail: merkle@math.uni-heidelberg.de