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Robin M. Schmidt

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Research and Work Experience

Max Planck Institute for Informatics & University of Tübingen *Aug 2020 – Present*
Research Intern in the Explainable Machine Learning Group of Prof. Dr. Zeynep Akata *Tübingen, Germany*

- Thesis Topic: Explainable Domain Generalization
- Developed Diversified Class Activation Maps for Domain Generalization (DivCAM)
- Developed Self-Challenging Attribute Prototype Networks for Domain Generalization

Max Planck Institute for Intelligent Systems & University of Tübingen *Oct 2019 – May 2020*
Research Intern in the Methods of Machine Learning Group of Prof. Dr. Philipp Hennig *Tübingen, Germany*

- Compared state-of-the-art Deep Learning optimizers and configurations
- Open-Sourced results for novel optimization algorithm comparisons
- Enabled DeepOBS as benchmarking suite by creating optimization baselines
- Advanced development of DeepOBS by fixing very impactful bugs
- ➥ Featured in Andrew Ng's "The Batch" | grade for credit: **1.0** (german)

IBM Research & Development *Aug 2019 – Oct 2019*
Extreme Blue Intern supervised by Martin Oberhofer and Dr. Manfred Oevers *Böblingen, Germany*

- Lead intern team on research for master data management with internet of things
- Developed more effective instance-level product master data representations
- Developed a healthcare proof of concept with React.js and a RESTful API
- Worked closely with offering management in the U.S. to deploy the results
- Presented the results during internal and external events, conferences, or exhibitions

Cooperative State University Baden-Württemberg Stuttgart *Oct 2017 – Jun 2018*
Research Intern supervised by Prof. Dr.-Ing. Olaf Herden *Horb, Germany*

- Compared state-of-the-art NewSQL databases for modern applications
- Provided heuristics for the appropriate NewSQL database selection

Eisenmann SE *Oct 2015 – Oct 2018*
Research & Development Engineer (Co-op) + Bachelor Thesis *Böblingen, Germany*

- Implemented better KPIs for improved performance insights
- Developed an uncertainty-based single product tracking system for limited sensor data
- Took the initiative to solve sensor data collection problems on-premise in the USA
- Wrote three papers on these topics under a non-disclosure agreement

Education

University of Tübingen | *M.Sc. – Computer Science* *Oct 2018 – Present*
Focus on Machine Learning – **Grade: *1.38/1.0*** Grading scale: 1.0 (best) to 5.0 (fail)

DHBW Stuttgart | *B.Sc. – Computer Science* *Oct 2015 – Oct 2018*
Undergraduate education – **Grade: *2.0/1.0*** Grading scale: 1.0 (best) to 5.0 (fail)

Skills

Languages: German (native), English (business fluent), Latin (small latinum certificate), Japanese (beginner)
Concepts: Machine Learning, Deep Learning, Optimization, Domain Generalization
Programming: Python, Java, C#, Prolog, Matlab, R, SQL, Gremlin, HTML5, CSS3, JavaScript
Frameworks & Tools: PyTorch, TensorFlow, Flask, Pandas, Git, Linux, Docker, Kubernetes, LaTeX
Databases: MySQL, Oracle, JanusGraph, MongoDB, VoltDB, NuoDB, CockroachDB

Selected Projects & Contributions

DeepOBS: Optimization Benchmarking Suite – Contributed Baselines, Scripts and improved Software Quality

DomainBed: Domain Generalization Benchmarking Suite – Contributed Algorithms and other features

Recommender Systems: Analyzed *recourse* and *availability* under model uncertainty, discrepancy, and ambiguity

Invited Talks & Keynotes

KTH Royal Institute of Technology: *Stockholm, Sweden* — *September 25th, 2020*

IBM Extreme Blue Conference: *Cluj-Napoca, Romania* — *September 3rd, 2019*

Publications

[SSH21] **Robin M. Schmidt**, Frank Schneider, and Philipp Hennig. "Descending through a Crowded Valley - Benchmarking Deep Learning Optimizers". In: *International Conference on Learning Representations, ICLR*. (under review). 2021.

Preprints

[SMA21] **Robin M. Schmidt**, Massimiliano Mancini, and Zeynep Akata. *Explainability-aided Domain Generalization*. (in progress). 2021.

[SH20] **Robin M. Schmidt** and Moritz Hahn. *Collaborative Filtering under Model Uncertainty*. 2020. arXiv: 2008.10117 [cs.LG].

[Sch19] **Robin M. Schmidt**. *Recurrent Neural Networks (RNNs): A gentle Introduction and Overview*. 2019. arXiv: 1912.05911 [cs.LG].

Theses

[Sch21] **Robin M. Schmidt**. *Explainable Domain Generalization for Image Classification*. M.Sc. Thesis. (in progress). 2021.

[Sch18a] **Robin M. Schmidt**. *Conception and Implementation of a Single Product Tracking System within a press hardening production line*. B.Sc. Thesis. (subject to a NDA). 2018.

Unpublished & Industry Research

[Sch18b] **Robin M. Schmidt**. *Improvements for the configurable Data Analysis Pipeline within a Manufacturing Execution System*. (subject to a NDA). 2018.

[Sch18c] **Robin M. Schmidt**. *New SQL Databases: An empirical evaluation of Open Source NewSQL databases regarding modern application scenarios*. (title translated from german). 2018.

[Sch17] **Robin M. Schmidt**. *Calculation and Evaluation of Key Performance Indicators for production within a Manufacturing Execution System*. (subject to a NDA). 2017.

Other Interests

Street Photography: Samples of my side work – Selling metal, paper, or canvas prints of my street photography art