







# Robin M. Schmidt

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Robin M. Schmidt 

## EDUCATION

**University of Tübingen** | *M.Sc. – Computer Science*

March 2021

Focus on Machine Learning – Cumulative GPA: 1.38/1.0

Tübingen, Germany


**DHBW Stuttgart** | *B.Sc. – Computer Science*

October 2018

Undergraduate education – Cumulative GPA: 2.0/1.0

Horb, Germany

## WORK EXPERIENCE

**IBM Research & Development** 

Aug 2019 – Nov 2019

Software Engineer (Backend)

Böblingen, Germany

- Led intern team on incorporating Internet of Things requirements into master data.
- Conceptualized more effective instance-level product master data graph representations which opened up new use-case sectors and marketing opportunities.
- Developed a prototype with React.js, a python RESTful API, and Cassandra & JanusGraph databases which allowed users to connect and visualize sensor data in real-time.
- Presented the results to the team's global head and wrote requested summary detailing value proposition and implementation details for senior leadership.

**Eisenmann SE** 

Oct 2015 – Oct 2018

Software Engineer (Backend)

Böblingen, Germany

- Developed the Manufacturing Execution System “E-MES” in an agile environment.
- Improved the configurable data analysis pipeline for “E-MES” by implementing and analyzing different reporting-frameworks (e.g. JasperReports, BIRT, Pentaho, Tableau).
- Implemented better KPIs for improved performance insights of many customers by collecting customer requirements and providing pre-defined reporting solutions via JasperReports.
- Conceptualized an uncertainty-based single product tracking system for a press-hardening production line with limited sensor data for an US customer.
- Took the initiative to solve under-specified sensor data collection problems on-premise in the USA, which was essential for the team to complete the project on-time.

## RESEARCH EXPERIENCE

**Max Planck Institute for Informatics & University of Tübingen**

Aug 2020 – Present

Research Scientist in the Explainable Machine Learning Group

Tübingen, Germany

- Research on Explainability-aided Domain Generalization for Image Classification.
- Advanced state-of-the-art performance on multiple machine learning generalization datasets.
- Developed Diversified Class Activation Maps for Domain Generalization (DIVCAM).
- Developed Self-Challenging Attribute Prototype Networks (PRODROP).

**Max Planck Institute for Intelligent Systems & University of Tübingen** 

Oct 2019 – May 2020

Research Scientist in the Methods of Machine Learning Group

Tübingen, Germany

- Research on stochastic non-convex optimization in Deep Learning.
- Enabled DeepOBS as benchmarking suite by creating exhaustive optimization baselines.
- Advanced development of DeepOBS by fixing and developing key features.
- Open-Sourced results for plug-and-play novel optimization algorithm comparisons.
- ➡ **Publication:** “Descending through a Crowded Valley – Benchmarking Deep Learning Optimizers” in *International Conference on Machine Learning, ICML 2021* (under review)
- ➡ Work featured twice in Andrew Ng’s machine learning newsletter “The Batch”.

## SKILLS

**Concepts:** Machine Learning, Deep Learning, Optimization, Domain Generalization

**Programming:** Python, Java, C++, Prolog, Matlab, R, JavaScript

**Frameworks & Tools:** PyTorch, TensorFlow, Flask, Pandas, Docker, Git, Linux, SQL, Gremlin,  $\text{\LaTeX}$

**Databases:** MySQL, Oracle, JanusGraph, Cassandra, MongoDB, VoltDB, NuoDB, CockroachDB


**Languages:** German (native), English (business fluent), Japanese (beginner)

## SELECTED PROJECTS & CONTRIBUTIONS

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**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 and discrepancy.

**App2Night:** Cross-platform mobile app to create, attend, and rate user-generated events in real time.

**SiteScrawler:** Web-App to provide users via email and online with relevant news articles based on their interests.

## INVITED TALKS & KEYNOTES

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**KTH Royal Institute of Technology:** *Stockholm, Sweden*

*September 25<sup>th</sup>, 2020*

**IBM Extreme Blue Conference:** *Cluj-Napoca, Romania*

*September 3<sup>rd</sup>, 2019*

## PUBLICATIONS

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[SSH21] **Robin M. Schmidt**, Frank Schneider, and Philipp Hennig. “Descending through a Crowded Valley – Benchmarking Deep Learning Optimizers”. In: *International Conference on Machine Learning, ICML*. (under review). 2021.

## PREPRINTS

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[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

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[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

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[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

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