




# Robin M. Schmidt

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Robin M. Schmidt 

## EDUCATION

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### University of Tübingen

Master of Science in Computer Science

Mar 2021

Tübingen, Germany

- Cumulative GPA: 1.4/1.0 on a grading scale from 1.0 (best) to 5.0 (fail).
- Relevant Coursework: Data Mining & Probabilistic Reasoning, Advanced Computer Vision & Machine Learning, Advanced Deep Neural Networks, Advanced Perception Engineering.

### Cooperative State University Stuttgart

Bachelor of Science in Computer Science

Oct 2018

Horb, Germany

- Cumulative GPA: 2.0/1.0 on a grading scale from 1.0 (best) to 5.0 (fail).
- Relevant Coursework: Knowledge-based Systems, Statistics, Applied Mathematics.

## WORK EXPERIENCE

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### IBM Research & Development

Software Engineer Intern (Backend)

Aug 2019 – Nov 2019

Böblingen, Germany

- Incorporated Internet of Things requirements into IBM's Master Data Management.
- Led project team and conceptualized more effective instance-level master data graph representations that 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 and offering management.

### Eisenmann SE

Software Engineer (Backend)

Oct 2015 – Oct 2018

Böblingen, Germany

- Improved the configurable data analysis pipeline for the Manufacturing Execution System "E-MES" by analyzing different reporting-frameworks (e.g. JasperReports, BIRT, Pentaho, Tableau) and implementing them for convenient customer usage.
- Implemented better KPIs for improved performance insights of many customers by collecting customer requirements and providing 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 successfully complete the project on-time.

## RESEARCH EXPERIENCE

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

Research Scientist in the Explainable Machine Learning Group

Aug 2020 – Present

Tübingen, Germany

- Research on Explainability-aided Domain Generalization for Image Classification that led to state-of-the-art advancements on multiple generalization datasets.
- Developed two novel algorithms for domain generalization called Diversified Class Activation Maps (DIVCAM) and Self-Challenging Attribute Prototype Networks (PRODROP).

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

Research Scientist Intern in the Methods of Machine Learning Group

Oct 2019 – May 2020

Tübingen, Germany

- Research on Stochastic Non-Convex Optimization that enabled the optimization benchmarking suite "DeepOBS" via open-sourced baselines of 50,000 individual training runs.
- Advanced development of "DeepOBS" by fixing and developing key features that included batch comparison scripts, analysis code, and multiple framework endpoints.
- ➡ Publication: "Descending through a Crowded Valley – Benchmarking Deep Learning Optimizers" under review at *Anonymous Machine Learning Conference* 2021.
- ➡ Work featured twice in Andrew Ng's weekly machine learning newsletter "The Batch".

## SKILLS

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

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

**Frameworks & Tools:** PyTorch, TensorFlow, NumPy, Flask, Django, Pandas, Docker, Git, Linux, SQL, Gremlin, Jira, Confluence.

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


**Languages:** German (native), English (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

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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: *Anonymous Machine Learning Conference*. (under review). 2021.

## PREPRINTS

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[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**. *Explainability-aided Domain Generalization for Image Classification*. M. Sc. Thesis. 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 & ACTIVITIES

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

**Google Hash Code 2021:** Organized a virtual hub and placed in the Top-15% of participating teams worldwide.