

# Robin M. Schmidt

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Robin M. Schmidt 🏠

## EXPERIENCE

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### Apple

AI/ML Resident

Jul 2021 – Jul 2022

Aachen, Germany

[Python, Bash]

- Member of the Machine Translation team that is responsible for translations across the Apple ecosystem (many billion words/day) including the translate app, Safari, and Siri translations.
- Improved and productionized multilingual machine translation models that boosted translation quality up to 7 BLEU across many language pairs and reduced the number of deployed models.
- Advanced the translation accuracy, inference time, and memory usage of the Transformer models by implementing novel architectures including non-autoregressive and knn-MT approaches.

### Max Planck Society (MPI-IS & MPI-INF)

Machine Learning Researcher

Oct 2019 – Mar 2021

Tübingen, Germany

[Python, Bash]

- Advanced development of the “DeepOBS” framework by fixing and developing key features that included batch comparison scripts, analysis code, and multiple framework endpoints.
- 📄 Published empirical analysis of 15 stochastic non-convex optimization methods on 8 problems resulting in 50,000 individual training runs at ICML 2021 (supervisor: *Philipp Hennig*).
- 📄 Developed Domain Generalization methods for CNN-based image classification that led to state-of-the-art advancements on various generalization datasets (supervisor: *Zeynep Akata*).

### IBM 📄

Extreme Blue Technical Leadership Program (Backend)

Aug 2019 – Oct 2019

Böblingen, Germany

[Python, JS]

- Managed intern team and conceptualized more effective instance-level master data graph representations that opened up new use-case sectors for Internet of Things requirements.
- 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

[Java, JS]

- Improved the configurable data analysis pipeline for the Manufacturing Execution System “E-MES” by implementing better reporting-frameworks for convenient customer usage.
- Conceptualized and implemented an uncertainty-based single product tracking system that significantly improved transparency and insights for production lines with limited sensor data.
- 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.

## EDUCATION

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### University of Tübingen, Germany

Master of Science (M. Sc.) in Computer Science

Oct 2018 – Mar 2021

GPA: 1.4/1.0 (German)

### Cooperative State University Stuttgart, Germany

Bachelor of Science (B. Sc.) in Computer Science

Oct 2015 – Oct 2018

GPA: 2.0/1.0 (German)

## PEER-REVIEWED PUBLICATIONS

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- [SSH21] **Robin M. Schmidt**, Frank Schneider, and Philipp Hennig. “Descending through a Crowded Valley – Benchmarking Deep Learning Optimizers”. In: *Proceedings of the 38th International Conference on Machine Learning, ICML*. (acceptance rate: 21.4%). 2021, pp. 9367–9376.

## SKILLS

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

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

**Frameworks & Tools:** PyTorch, TensorFlow, Fairseq, Faiss, Slurm, NumPy, Flask, Django, Pandas, Docker, Git, Linux, SQL, Gremlin, Matplotlib, HTML, CSS, Jira, Confluence, L<sup>A</sup>T<sub>E</sub>X.

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

**Languages:** German (*native*), English (*near native*), Japanese (*beginner*).


## SELECTED OPEN-SOURCE 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.

**NL-Augmenter:** NLP text transformations and dataset filters – Contributed two filters and code quality changes.

**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 & POSTER SESSIONS

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**King's College London:** *Virtual – Industry Insight* December 2<sup>nd</sup>, 2021

**Apple AI/ML Machine Translation:** *Virtual – Deep Learning Optimization* October 20<sup>th</sup>, 2021

**International Conference on Machine Learning ‘21:** *Virtual – Spotlight Optimization Paper* July 21<sup>st</sup>, 2021

**KTH Royal Institute of Technology:** *Virtual – Deep Learning Optimization* September 25<sup>th</sup>, 2020

**IBM Extreme Blue Conference:** *Cluj-Napoca, Romania – MDM Project* September 3<sup>rd</sup>, 2019

## THESES

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[Sch21] **Robin M. Schmidt.** *Explainability-aided Domain Generalization for Image Classification.* M. Sc. Thesis. 2021. arXiv: 2104.01742 [cs.LG].

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

## PREPRINTS & TECHNICAL REPORTS

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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].

[Sch18b] **Robin M. Schmidt.** *Improvements for the configurable Data Analysis Pipeline within a Manufacturing Execution System.* (subject to an 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 an NDA). 2017.

## OTHER INTERESTS & ACTIVITIES

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

**Academic Duties:** Served as a reviewer for ML conferences such as ICLR 2022 or Apple ML Summit 2022.

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