

# Robin M. Schmidt

robin.schmidt.97@web.de ✉  
linkedin.com/schmidt-robin in  
robinschmidt.netlify.com 🌐  
github.com/SirRob1997 🐙  
Robin M. Schmidt 🇩🇪

## EXPERIENCE

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### Apple

Machine Learning Research Engineer

Jul 2021 – Present

New York City, USA

[Python, Bash]

- Member of the Machine Translation team that is responsible for translations across the Apple ecosystem (many billion words/day) with requests coming from the “Translate” app, Safari, Siri, Camera, etc.
- Improved and productionized multilingual machine translation models that boosted translation quality up to 5 BLEU across many language pairs and reduced the number of deployed models.

AI/ML Resident

- Selected among over 8,000 applicants for the first global cohort of 10 AI/ML Residents at Apple.
- Advanced the translation accuracy, inference speed, and memory usage of the Transformer models by implementing novel architectures including research on non-autoregressive approaches.

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

Machine Learning Researcher

Oct 2019 – Mar 2021

Tübingen, Germany

[Python, Bash]

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

### IBM

Software Engineer Intern (Backend)

Aug 2019 – Oct 2019

Böblingen, Germany

[Python, JS]

- Lead Extreme Blue 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]

- Conceptualized and implemented an uncertainty-based single product tracking system that significantly improved transparency and insights for production lines with limited sensor data.
- Improved the configurable data analysis pipeline for the Manufacturing Execution System “E-MES” by implementing better reporting-frameworks for convenient customer usage.
- Took the initiative to solve under-specified sensor data collection problems on-premise for a customer 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 (Germany) | 3.8/4.0 (USA)

### Cooperative State University Stuttgart, Germany

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

Oct 2015 – Oct 2018

GPA: 2.0/1.0 (Germany) | 3.3/4.0 (USA)

## PEER-REVIEWED PUBLICATIONS

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- 2022 [1] **Robin M. Schmidt**, et al. 2022. “Non-Autoregressive Neural Machine Translation: A Call for Clarity”. *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing, EMNLP*, (under submission).
- 2021 [2] Kaustubh D. Dhole, [...], **Robin M. Schmidt**, et al. 2021. “NL-Augmenter: A Framework for Task-Sensitive Natural Language Augmentation”. *Proceedings of Anonymous Machine Learning Conference*, (under submission).

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

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## SKILLS

**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,  $\LaTeX$ .

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

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

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## SELECTED OPEN-SOURCE PROJECTS AND CONTRIBUTIONS

🔗 **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 filters and code quality changes.

🔗 **Recommendation 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.

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## INVITED TALKS AND POSTER SESSIONS

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

**Apple AI/ML Machine Translation:** *Virtual – Deep Learning Optimization Paper* 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 Paper* September 25<sup>th</sup>, 2020

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

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## PREPRINTS AND TECHNICAL REPORTS

- 2020 [4] **Robin M. Schmidt** and Moritz Hahn. 2020. Collaborative Filtering under Model Uncertainty. *arXiv*, [arxiv.org/abs/2008.10117](https://arxiv.org/abs/2008.10117).
- 2019 [5] **Robin M. Schmidt**. 2019. Recurrent Neural Networks (RNNs): A gentle Introduction and Overview. *arXiv*, [arxiv.org/abs/1912.05911](https://arxiv.org/abs/1912.05911).
- 2018 [6] **Robin M. Schmidt**. 2018. Improvements for the configurable Data Analysis Pipeline within a Manufacturing Execution System. (subject to an NDA).
- [7] **Robin M. Schmidt**. 2018. New SQL Databases: An empirical evaluation of Open Source NewSQL databases regarding modern application scenarios. (title translated from german).
- 2017 [8] **Robin M. Schmidt**. 2017. Calculation and Evaluation of Key Performance Indicators for production within a Manufacturing Execution System. (subject to an NDA).

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## THESES

- 2021 [9] **Robin M. Schmidt**. 2021. Explainability-aided Domain Generalization for Image Classification. *arXiv*, [arxiv.org/abs/2104.01742](https://arxiv.org/abs/2104.01742).
- 2018 [10] **Robin M. Schmidt**. 2018. Conception and Implementation of a Single Product Tracking System within a press hardening production line. (subject to an NDA).

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## ACTIVITIES AND SERVICES

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

**Academic Service:** Served as a reviewer for ML conferences such as ICLR '22 (highlighted reviewer) or NeurIPS '22.

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