Daniel Bin **Schmid**

RESEARCHER · COMPUTER SCIENTIST

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Education

M.Sc. Informatics   *Current GPA: **1,3** /1,0*

TECHNICAL UNIVERSITY OF MUNICH (TUM)   *Okt. 2022 - Present*

- SPECIALISATION: Machine Learning and Analytics; SIDE SPECIALISATIONS: Databases and Information Systems, Robotics
- RESEARCH: Causality and Deep Learning (DL), DL Theory, Hardware Acceleration for DL

B.Sc. Media Informatics   *GPA: **1,9** / 1,0*

UNIVERSITY OF STUTTGART   *Okt. 2018 - Aug. 2022*

- Focuses: Brain-Computer-Interfaces, Computer Vision, Human-Computer-Interaction

Highlighted Projects

Causal Machine Learning: Generative AI & Causal Prediction   *w/ **TUM Camp & Torr Vision Group***

10/23 - 03/24 | PROJECT LINK | TUM-DI-LAB RESEARCH PROJECT IN COLLABORATION W/ UNIVERSITY OF OXFORD   *Lennart Bastian, Dr. Ashkan Khakzar*

- In a group of four selected students, we **identified own research directions**. Particularly, we:
  - **Improved image generation quality** of a CausalVAE (VAE with causal mechanism) by integrating it with a diffusion model (DDPM).
  - Investigated causally-inspired methods for more robust & explainable x-ray pathology classification.

Reinforcement Learning (RL) for Quadcopter Control   *w/ AIR, **TUM***

10/23 - 04/24 | GITHUB.COM/DANIELBINSCHMID/RL-PYBULLETS-CF | PRACTICAL   *Finn Suberkrüb, Prof. Berthold Bäuml*

- Software development of full pipeline for drones, from state estimation to low-level control. Experimentation with RL from drone racing.

Brain-Computer-Interfaces: On-Device Training   *w/ STAR, **Uni Stuttgart***

01/22 - 09/22 | GITHUB.COM/DANIELBINSCHMID/PORTABLE-BCI | BACHELOR'S THESIS AT UNIVERSITY OF STUTTGART   *Dr. Paul Genssler, Prof. Hussam Amrouch*

- Implemented machine learning **training on a resource-constrained Smartwatch** for preserving data privacy.
- Deployed deep transfer learning (DTL) with EEGNet (a CNN for EEG processing) on own brain-waves.
- **Improved subject transfer learning** of Hyperdimensional Computing (HDC) paradigms by drawing inspiration from DTL.

Project Collection

SEE GITHUB AND PORTFOLIO FOR DETAILS.

- 04/23 - 04/24: Researching **theoretical foundations of deep learning** with chair of TUM TFAI with special interest in Transformers.
- 10/22 - 02/23: Serverless distributed data processing on Microsoft Azure. GITHUB LINK.
- 10/22 - 02/23: Handgesture recognition demo for the Tech Challenge at UnternehmerTUM. GITHUB LINK.
- 10/21 - 02/22: Saliency map prediction on graphic designs with the excellent team of **PERCEPTUAL UI**.
- 04/21 - 09/22: Brain-inspired computing python framework to facilitate research on HDC.

Work Experience

Research Assistant for Transformer Acceleration   *Munich, Germany*

TUM CHAIR OF AI PROCESSOR DESIGN (AI-PRO)   *Apr 2023 - Apr 2024*

- **Guiding small research team** of three students; Co-advising two B.Sc. students on their thesis.
- Identifying research questions in interactive sessions with advisor Prof. Amrouch (amrouch@tum.de).
- Exploiting sparsity; Fine-tuning; Quantization; RISC-V ISA design with Chipyard & Synopsis; C code for Transformers

MLOps Engineer   *Munich, Germany*

MAURER ELECTRONICS GMBH   *Feb 2023 - Jul 2023*

- Integration of ML model inference into existing C++ Computer Vision software. Model versioning and pipeline automation.

Teaching Assistant for Theoretical Computer Science   *Stuttgart, Germany*

FORMAL METHODS OF INFORMATICS, UNIVERSITY OF STUTTGART   *Okt 2020 - Feb 2021*

- Teaching 46 students in bi-weekly sessions, grading homeworks and granting exam permissions

Skills

Programming Languages   Python • C • C++ • Java • Chisel • Julia • Shell • SQL • C# • Verilog • Assembly • LaTeX • NodeJs

Tools & Frameworks   PyTorch • TensorFlow • ROS2 • Chipyard • Docker • Microsoft Azure • AWS • Matlab • Linux • Git

Languages   German (native) • English (C1)