Boris Meinardus

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LinkedIn, Github, Medium

EXPERIENCE

- **Fraunhofer Heinrich Hertz Institute** — Berlin, Germany
  Student Researcher – Applied Machine Learning — *04/2022 - Present*
  - **Data Engineering**: Build large, custom datasets by implementing fetcher and preprocessing units to periodically retrieve data from varying sources using Python and Pandas. Implement and maintain a robust and dynamic PostgreSQL database using SQLAlchemy.
  - **Neural Network Modelling**: Develop, implement, and tune graph neural network architecture for dynamic traffic flow prediction using PyTorch.
- **Fraunhofer Heinrich Hertz Institute** — Berlin, Germany
  Student Researcher - Photonic Components — *02/2019 - 03/2022*
  - **Neural Network Modelling**: Develop UNET object detection model for detecting defects on wafers using PyTorch.
  - **Laboratory Experiments**: Execute and analyze experiments for optical modulators. Train new working students in laboratory skills.

PROJECTS

- **3D Aneurysm Detection**: Develop 3D Semantic Segmentation Convolutional Neural Network model for 3D Aneurysm Detection with a F1-Score of 0.39. Execute and track experiments varying the data augmentation, loss functions, and hyperparameters.
- **Arena-Rosnav**: Build modular training and deployment pipeline for seamless integration of different DRL models and different robots with Python and C++. Develop a custom gym environment. Develop and deploy DRL-based agents for dynamic obstacle avoidance with success rates of 95%.
- **Implementation of RCPO**: Implement Reward Constrained Policy Optimization (RCPO) into stable-baselines3 implementation of Proximal Policy Optimization (PPO) using PyTorch. Reproduce results through experimental tracking using weights and biases. Write and submit respective article to the ICLR Blog Track.
- **YouTube: Boris Meinardus**: Documentation of personal Machine Learning progress. Lectures on Machine Learning theory. Development and demonstration of Machine Learning projects. Advice on entering the field of Machine Learning.

PUBLICATIONS

- **Arena-Bench**: Robotics and Automation Letters (RA-L) Journal, 2022
  L. Kästner, T. Bhuiyan, T. A. Le, E. Treis, J. Cox, **B. Meinardus**, J. Kmiecik, R. Carstens, D. Pichel, B. Fatloun, N. Khorsandi, J. Lambrecht
- **Simulation framework for EtherCAT over TSN**: IFIP Networking Conference (IFIP Networking), 2021
  B. Balakrishna, **B. Meinardus**, L. Kontopoulos

EDUCATION

- **Technical University of Berlin** — Berlin, Germany
  MSc Computer Science — *09/2021 – 08/2024*
  - **Relevant Courses**: Deep Learning 1, Machine Learning 1, Automatic Image Analysis, ML in Medical Image Processing, Advanced Topics in Reinforcement Learning
- **Technical University of Berlin** — Berlin, Germany
  BSc Computer Engineering; GPA: 3.0 (84.5/100) — *09/2018 – 08/2021*
  - **Thesis**: Deployment and Evaluation of Deep-Reinforcement-Learning-Based Navigation Approaches on Real Robots
  - **Relevant Courses**: Algorithms and Datastructures, Introduction into AI

SKILLS

- **Programming Languages**: Python, C++, SQL
- **Programming Frameworks**: PyTorch, OpenCV, Huggingface, Pandas, NumPy, Matplotlib, Seaborn
- **Technologies**: Deep Learning, Computer Vision, Weights and Biases, Docker, Git, GCP, Linux
- **Languages**: German (Native), English (Full Professional Proficiency), Bulgarian (Native), Mandarin (Elementary Proficiency)