

## SKILLS

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- **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)

## EXPERIENCE

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- **Technical University of Darmstadt** Darmstadt, Germany  
*Student Researcher – Reliable Multimodal AI Lab (Prof. Marcus Rohrbach)* 10/2023 - Present
  - **Literature Review:** Review 20+ Vision-Language-Modelling papers.
  - **Modelling:** Develop transformer-based **multimodal large language model for video understanding** using PyTorch. Leverage distributed training across 8 A100 GPUs. Beat current state-of-the-art models by up to 11% on 2 benchmarks. **First-author submission to ECCV 2024.**
- **Fraunhofer Heinrich Hertz Institute** Berlin, Germany  
*Student Researcher – Applied Machine Learning* 04/2022 - 09/2023
  - **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 model for detecting defects on wafers using PyTorch.

## PROJECTS

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- **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 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**.
- **3D Aneurysm Detection:** Develop 3D Semantic Segmentation CNN model for 3D Aneurysm Detection with a F1-Score of 0.39. Execute and track experiments varying the data augmentation, loss functions, and hyperparameters.

## PUBLICATIONS

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- **Arena-Bench:** IROS and 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

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- **Technical University of Berlin** Berlin, Germany  
*MSc Computer Science* 10/2021 – 09/2024
  - **Relevant Courses:** Deep Learning 1 & 2, 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: 1.8/1.0 (84.5/100)* 10/2018 – 09/2021
  - **Thesis:** Deployment and Evaluation of Deep-Reinforcement-Learning-Based Navigation Approaches on Real Robots (Grade 1.0/1.0)
  - **Relevant Courses:** Algorithms and Data Structures, Introduction to AI