Tobias Jülg

Doctoral Researcher @ UTN

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Education

11/20–09/23 **Master of Science in Informatics**, *Technical University of Munich (TUM)*, Munich.
- Grade: 1.0 (GPA 4.0) passed with high distinction; top 2%
- Specialized in Machine Learning, Neurorobotics and Computer Networks
- Summer schools: Ferienakademie 2021 seminar "Deep Learning in Image and Video Processing" and Ferienakademie 2023 seminar "Neural Network Compression"

10/22–03/23 **Visiting Research Graduate**, *The University of Tokyo*, Intelligent Systems and Informatics Laboratory, Japan.
- Researched Multi-modal Representation Learning for infant motor simulation by combining multi-modal Self-Organizing Maps (SOM) with pre-trained autoencoder embeddings, implemented in PyTorch
- Improved the training and inference performance of the learned map
- Published at AMAM2023, paper P57
- Grade: A/A

08/18–12/18 **Semester Abroad**, *City University of Hong Kong*, Hong Kong.
Focus on Machine Learning and Data-Intensive Computing

10/16–05/20 **Bachelor of Science in Informatics**, *Technical University of Munich*, Munich.
- Overall grade: 1.7
- Thesis at the Chair of Robotics, Artificial Intelligence and Embedded Systems with the title "Development of a Training Scheduler for Curriculum-Based Reinforcement Learning in Robotics". Grade: 1.0
- Minor in Physics

2008–2016 **A-Level**, *Ignaz Kögler School*, Landsberg am Lech, Bavaria, Germany.
Grade: 1.5

Experience

Since 10/23 **Doctoral Researcher**, *University of Technology Nuremberg (UTN)*, Nuremberg.
- Research: Multi-modal foundation models for robotic manipulation
- Software Development: Built a C++/Python control stack for the FR3 robotic arms which unifies MuJoCo simulation and realworld robot control
- Leadership: Advising and supervising the lab's research assistance and master thesis
- Teaching: Very first iteration of the Machine Learning course at UTN: Drafting and planning the course together with the professor to fit UTN's innovative teaching concepts. Creating ML exercises from scratch.
- Founding member of the Machine Intelligence Lab

Since 04/23 **Co-Founder and Fullstack Opensource Developer**, *StuStaPay*, Munich.
- Responsible for the customer portal and payout procedure of StuStaPay, the first opensource electronic wristband payment system for festivals, available on Github
- Worked with Python FastAPI, PostgreSQL, React and Typescript

12/21–09/22 **Machine Learning Consultant**, *Max Planck Institute of Physics, TUM (IDP)*, Belle II, Munich.

Improved the neural network trigger at the Belle II particle collider experiment by incorporating state of the art supervised machine learning techniques into the training process using PyTorch.

05/21–07/22 **Working Student Deep Learning**, *Cruise Munich GmbH*.

- Worked on deep learning algorithms for 3D object detection in radar/camera-centric automotive perception: radar compression algorithms and radar simulation
- Technologies: PyTorch (Lightning), Python, SQL and GCP

06/20–04/21 **Research Assistant and Guided Research**, *Chair of Robotics, Artificial Intelligence and Embedded Systems*, Human Brain Project.

- Unpublished research work "Self-Supervised Learning of Sensorimotor Representations in a Neurorobotics Experiment"
- Explored novel self-supervised autoencoder-like architectures, implemented in PyTorch, to better understand whether a shared latent space between visual and sensory cortex as in the human brain can arise from artificial setups

04/19–04/20 **Teaching Assistant**, *Faculty for Informatics*, TUM.

As a teaching assistant I held tutorials and corrected homework for the following lectures:

- Discrete Structures (IN0015) in the winter semester 2019/2020
- Fundamentals of Algorithms and Data Structures (IN0007) in the summer semester 2019

2017–2018 **Working Student**, *Infineon*, Munich.

Development of a Django based web interface which demonstrated hardware encryption of the Infineon-TPM-Chip to customers.

Voluntary Commitment

Since 05/23 **Research and Development Engineer**, *TUM.ai e.V.*, Munich.

07/21–06/22 **CTO and Board Member**, *StuStaNet e.V.*, Munich.

- Responsible for the internet infrastructure of 2000 students in the Studentenstadt Freimann
- Developed, tested, deployed and maintained new and existing services and IT infrastructure

10/20–10/22 **Tutor**, *ESN TUMi e.V.*, Munich.

02/19–08/19 **Mentor**, *MINGA Mentoring at TUM Informatics Department*.

Since 2017 **Network Administrator**, *StuStaNet e.V.*, Munich.

2017–2022 **Floor Representative**, *Studentenstadt Freimann*, Munich.

Honors and Scholarships

10/22–03/23 **JASSO Scholarship**, *The University of Tokyo*, Japan.

Scholarship for visiting students with excellent grades at their home universities.

10/19–09/22 **Deutschlandstipendium (Scholarship)**, *Federal Republic of Germany, TUM*.

Given to exceptionally performing students who are a the same time very engaged in extracurricular activities.

12/19 **Intercultural Certificate: Option Mobility**, *TUM*.

The intercultural certificate is awarded to students with further voluntary engagement and interest in the country where they went abroad.

11/19 **First Price at HackaTUM**, *JetBrains*, TUM, Munich.

- One of the biggest hackathons in Europe organized by TUM
- Developed app which tracks uncommited changes in source code and highlights them in IntelliJ IDEs and Gitlab to prevent merge conflicts

06/16 **Abiturpreis der DPG (Award)**, *German Physical Society*.

Awarded to students with outstanding grades in their physics Abitur.