Chuanlong Zang

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Education

Master

since 11/2020
exp 09/2023

Technical University of Munich, *Munich, Germany*
Major: Robotics, Cognition, Intelligence (Informatic)
Relevant coursework: deep learning for 3D computer vision, multiple view geometry
Master Thesis: Robust Human Mesh and Global Trajectory Recovery with a Dynamic Monocular Camera *(keywords: Human dynamics, deep learning)*
Current grade without thesis: *1.4 / 1.0 (top 5%)*

Bachelor

09/2016 - 09/2020

Tongji University & Bochum University of Applied Sciences
Degree: B.Eng. in Mechatronic (double degree)
Relevant coursework: robotics, functional programming, mechanical and electrical components
Bachelor Thesis: Mobile robots with sensors for localization and collision avoidance for the OPTIMUM platform *(keywords: ROS, SLAM, multi-sensor fusion)*
Grade: *4.12 / 5.0 (top 15%)*

Internships

04/2023 – 07/2023

Schwarz IT KG
Research Assistant, Computer Vision Team

- Built a robust real-time production detection and classification prototype in the factory
- Improved classification results especially for unbalanced datasets
- Captured videos to create a large-scale dataset for the machine learning model

The deep learning model has achieved a 99.7% on the F1 score during testing.

06/2021 - 12/2022

HAWE Hydraulics
Working Student, IT Business Solutions Team

- Implemented an anomaly detection tool for sensors using mathematical modeling and modeling-based optimization
- Built a big cloud-based data (TB) analyzation pipeline with Azure and Databricks
- Designed a temporal data prediction system using ARIMA and Facebook Prophet

The final temporal prediction model has been deployed in the company.

12/2020 - 05/2021

Technical University of Munich
Intern, Data Analytics and Machine Learning Group, supervised by Prof. Armin Moin

- Designed a website for a start-up company
- Organized the development of a model-driven software engineering tool with full code generation and out-of-the-box ML support for smart services

The start-up company received an EXIST Business Start-Up Grant in 2021.

09/2019 - 02/2020

Bochum University of Applied Sciences
Intern, Industrial Robotics Specialist Group, supervised by Prof. Daniel Schilberg

- Manipulated the FANUC robot using TCP (Tool Center Point) programming
- Programmed the robot to recognize and sort different objects using cameras

03/2019 - 07/2019

Tongji University
Research Assistant, School of Mechanical Engineering, supervised by Prof. Nan Xie

- Acquired electrical and mechanical data from CNC lathe using various sensors
- Analyzed lathe conditions using KPCA-ELM and CNN models in the cloud

Final test accuracy with CNNs was over 90% on the dataset.

Research Projects

08/2022 - 08/2023 **Master Thesis: Robust Human Mesh and Global Trajectory Recovery from Dynamic Monocular Camera**

Supervised by Dr. Xingxing Zuo, Simon Schaefer and Prof. Stefan Leutenegger

- Developed a system to manage long-term occlusions and retrieve 3D human pose from monocular videos in four stages
- Enhanced performance using joint visibility and a transformer motion filler without increasing model size
- Created a novel dual-branch network to refine global trajectories from body poses
- Proposed a novel formula to determine global camera pose using calibrated cameras

Current results outperform GLAMR by 30% (G-MPJPE), 93% (Accel) on EgoBody Dataset and will be submitted to a top-tier conference in 2023.

03/2022 - 09/2022 **Large-Scale Machine Learning**

Supervised by Nicholas Gao and Prof. Stephan Günnemann

- Developed various ML algorithms in collaboration with BMW to determine the position of occupants around the vehicle based on BMW digital key plus
- Utilized a temporal model to handle cases where signals from sensors are missing

The final DimeNet model achieved an accuracy of over 94% on the test dataset.

04/2022 - 06/2022 **Advanced Deep Learning in Computer Vision**

Supervised by Zhenyu Chen and Prof. Matthias Nießner

- Solved 3D visual grounding tasks with sequence processing idea based on SeqTR

04/2021 - 10/2021 **Cloud-Based Machine Learning in Robotics**

Supervised by Dr. Florian Walter

- Designed and developed distributed RL algorithms (DDPG, TD3, SAC) on the NRP (Neurorobotics Platform)
- Improved the performance of robotic grasping task by using appropriate dynamic training schedule function for curriculum learning

The article was presented at the 6th HBP Student Conference on Interdisciplinary Brain Research in February 2022.

Languages

Mandarin	Native
English	Full professional proficiency
German	Professional proficiency

Awards

09/2022 – 09/2023	Deutschland Stipendium (Awards for excellent academic performance and social activities)
09/2016 - 07/2019	Excellent Student Award from Tongji University (every year)

Technical skills

Languages	Python, Unix Shell, C++, Java, HTML/CSS
OS	Linux, Mac, Windows, Rasbian
Frameworks	PyTorch, Pandas, OpenCV, MATLAB, React.js, CAD
Toolkits	MongoDB, Docker, Anaconda, Git, LaTeX
Hardware	Raspberry pi, mobile robot, 3D painting, cameras