Yihao **Wang**

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Education

Technical University of Munich — *Munich, Germany*

M.Sc. in Robotics, Cognition, Intelligence — *Oct. 2021 - PRESENT*

- Estimated GPA upon graduation: 1,6

Tongji University — *Shanghai, China*

B.Eng. in Mechanical Engineering — *Sep. 2016 - Jul. 2021*

- Overall GPA: 4.58/5, equivalent to 1,42 and 90.82%
- Ranked 1st out of the class in major-related courses.

Technical University of Munich — *Munich, Germany*

Exchange Student — *Oct. 2020 - Mar. 2021*

- Overall GPA: 1,7

Research Experience

DeSplat: Decomposed Gaussian Splatting for Distractor-Free Rendering — *Publication (Under Submission)*

Supervisor: Prof. Arno Solin & Dr. Marcus Klasson, Aalto University — *Jul. 2024 - Nov. 2024*

- Developed a photometric-based method to disentangle distractors by combining 2D masks with 3D Gaussian Splatting.
- Eliminated reliance on foundation models, achieving comparable or superior image quality in an off-the-shelf manner.
- Achieved rendering speed and memory usage comparable to vanilla Splatfacto, significantly surpassing baselines.
- Ensured compatibility with appearance modeling and background modeling methods from other concurrent works.

Adaptive Gaussian Splatting for Robust 3D Reconstruction — *Master Thesis*

Supervisor: Prof. Nassir Navab, CAMP, Technical University of Munich — *Nov. 2023 - Present*

- Implementing and refining scene reconstruction methods using Gaussian features, based on 2D Gaussian Splatting.
- Exploring various neural network architectures to enhance fine structure and foreground reconstruction.
- Conducted an in-depth comparative analysis of several baselines, including MonoSDF, NeuRIS, and Instant-angelo, using both quantitative and qualitative metrics to assess performance.

Multi-Sensor Data Fusion — *Student Assistant*

Student Assistance, Chair of Media Technology, TUM — *Jan. 2024 - Mar. 2024*

- Calibrated data from cameras, LiDAR, and millimeter-wave radar systems for multi-sensor fusion tasks.
- Leveraged the Segment Anything Model (SAM) to extract precise edges for LiDAR and camera calibration.
- Applied point cloud registration techniques to align mmWave Radar and LiDAR data accurately.
- Created a comprehensive dataset tailored for integration into the Robot Operating System (ROS) framework.

Visual-Inertial Tracking using Preintegrated Factors — *Practical Course*

Advisor: Jason Chui, CV Group, TUM — *Oct. 2022 – Jan. 2023*

- Realized tight-coupled visual-inertial odometry using camera and IMU for stability and scale observability.
- Preintegrated the IMU measurements between frames to estimate IMU pose, biases and velocity.
- Optimized the position of landmark and the pose of camera/IMU via bundle adjustment (ceres).
- Visualized the frames, estimated trajectory and ground truth (pangolin).
- Evaluated using RMS ATE and RPE, in which the ATE decreases from 0.149 (w/o IMU) to 0.115 (w/IMU).

Single-view 3D Reconstruction Supported by Classification — *Course Project*

Course: Machine Learning for 3D Geometry, given by Prof. Angela Dai — *May. 2022 - Jul. 2022*

- Replicated the baseline: Few-Shot Generalization for Single-Image 3D Reconstruction via Priors.
- Optimized the model by introducing a classification head.
- Achieved the IoU of 62.1%, which is higher than our replication of baseline (56%).

Design of a Super-resolution Imaging Device with Variable Field of View — *Bachelor Thesis*

Advisor: Professor Anhu Li, School of Mechanical Engineering, Tongji University — *Feb. 2021 - Jul. 2021*

- Award: Second Prize of Hirschvogel Excellent Thesis Scholarship.
- Realized multi-image super-resolution through pre-processing, registration, non-uniform interpolation, projection on convex sets, and iterative back-projection via MATLAB.
- Designed the worm gear system to control the Risley prisms, including modeling and simulation.
- Analyzed the thermal effect of the worm gear via ANSYS Workbench.

Working Experience

AgrAInno *Munich*

TUM Venture Lab, StartUp Project of Bridge-to-Innovation Grant *Aug. 2024 - Present*

- Developed a mobile platform for farmers to enhance agricultural productivity.
- Integrated federated learning into the mobile platform to ensure data privacy and security.
- Planning to incorporate a large language model (LLM) to provide advanced decision-making insights.

BMW Group *Munich*

Intern | AI Product *Apr. 2023 - Oct. 2023*

- Led research on "Manufacturability Prediction of Sheet Metal Forms in the Automotive Industry Using Deep Learning".
- Applied advanced neural network architectures and methodologies, including PointNet-based models (achieving 93% overall accuracy), transfer learning, clustering, upsampling, and comprehensive experimental analysis.
- Performed an in-depth literature review and data preprocessing for the project "Machine Learning-Driven Prediction of Acceleration Time-Series Based on 3D Data Models for Pedestrian Head Injury Assessment".

Volvo Car Corporation *Shanghai*

Intern | Personal Driving Experience Center *Mar. 2021 - Jul. 2021*

- Conducted interactive analysis of experimental data and visualized results using Python libraries (pandas, plotly, PyQt5, etc.).
- Automated text extraction from images and structured output using Python and Tesseract (pytesseract, xlwings, etc.).
- Designed a labor-saving device to accurately measure the stopping distance of cars.
- Developed an iOS application to collect and analyze experimental data, enhancing data accessibility and usability.

Activities

International Department of Student Union *Shanghai*

Core Member *Sep. 2016 - Feb. 2018*

- Organized activities like the "Buddy Program" and "Global Village" to help international students immerse in Chinese culture.
- Facilitated cultural exchange and strengthened connections between international and local students.

Piano Club *Shanghai*

President *Sep. 2019 - Jul. 2020*

- Organized performances, including the "Piano and Violin Concert", showcasing club members' talents.
- Managed the club's WeChat account, designed promotional posters, and increased audience engagement.

Honors & Awards

International

2019	**First Prize**, Covestro-Tongji "Future City" Application Design Competition	*Leverkusen*
2017	**Silver Award**, International Genetically Engineered Machine Competition (iGEM)	*Boston*

Domestic

2020	**First Prize**, Contemporary Undergraduate Mathematical Contest in Modelling	*Shanghai*
2021	**Outstanding Graduates (Top 10%)**, Tongji University	*Shanghai*
2020	**Scholarship for Social Activities**, Tongji University	*Shanghai*
2018	**Outstanding Student (Top 5%)**, Tongji University	*Shanghai*
2017	**Outstanding Student (Top 5%)**, Tongji University	*Shanghai*

Skills

Languages	English (C1), German (B2), French (A2), Chinese
Programming	Python, C++, MATLAB
Deep Learning	PyTorch, Jax
Tools	CUDA, Git, Docker, Linux, CMake
CAD/CAE	AutoCAD, SolidWorks, Inventor, ANSYS