Tianhao Wu

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Education Background

Beihang University (BUAA)   *Beijing, China*

Bachelor of Engineering in Computer Science and Technology   *Sept 2017 - Jul 2021*

- **Honors**: Merit Student of the School of Computer Science, Excellent Student of University.

Nanyang Technological University (NTU)   *Singapore, Singapore*

Ph.D. Candidate, S-Lab, Computer Science and Engineering. Supervisor: Prof. Tat-Jen Cham   *Jan 2022 - Sept 2025 Expected*

- **Research focus:** Computer Vision - 2D and 3D generation, reconstruction and editing.

Internship

ByteDance Inc.   *Beijing, China*

Full-time intern in AI-Lab intelligent voice group   *Feb 2021 - Jun 2021*

- Mainly responsible for voice activity detection(VAD).
- Build VAD datasets, train and fine-tune models according to different requirements. Integrate the latest research into the current models.
- On the business side, responsible for VAD model requirements including education and multi-language service.

SenseTime Inc.   *Beijing, China*

Full-time intern in driving planning group   *Oct 2021 - Dec 2021*

- Organizing the code of the autopilot planning part.
- Research the latest planning algorithms and apply them to autonomous driving system.

Research and Publications

Amodal3R: Amodal 3D Reconstruction from Occluded 2D Images (*In submission*)   *Jun2024 - Mar 2025*

- Given partially visible objects within images, our method reconstructs semantically meaningful 3D assets with reasonable geometry and plausible appearance, significantly outperforming current baselines.
- This work is done under the collaboration and guidance of Prof. Andrea Vedaldi and Dr. Chuanxia Zheng, Visual Geometry Group, University of Oxford.

ClusteringSDF: Self-organized neural implicit surfaces for 3D decomposition (*ECCV 2024*)   *Jul 2023 - Mar 2024*

- Proposed a novel segmentation method for 3d indoor scenes via object-compositional SDF.
- Our method doesn't require ground-truth segment labels for supervision, instead it can take inconsistent labels of multiple camera views from 2D pre-trained segmentation models.
- The segmentation accuracy outperforms current SOTA 3D semantic/instance segmentation methods.

LTOS: Layout-controllable Text-object Synthesis (*ICASSP 2025, coauthor*)   *Sept 2023 - Apr 2024*

- Proposed a framework that generates images with clear, legible visual text and plausible objects.
- Constructed a visual-text rendering module to synthesize text and employ an object-layout control module to generate objects while integrating the two modules to harmoniously generate text content and objects in images.
- Our method outperforms the state-of-the-art in both text rendering and layout-to-image tasks.

PanoDiffusion: 360-degree panorama outpainting via diffusion (*ICLR 2024*)   *Jan 2023 - Jun 2023*

- Proposed a new bi-modal latent diffusion structure that utilizes both RGB and depth panoramic data to better learn spatial layouts and patterns during training, works surprisingly well to outpaint normal depth-free RGB images .
- Designed a novel technique of introducing progressive camera rotations during each diffusion denoising step, which leads to substantial improvement in achieving panorama wraparound consistency.

Predictive State Representation   *Jan 2022 - Oct 2022*

- Aimed to implement a competitive model-based model using the concept of predictive state representation.
- Tested our model in both continuous and discrete environments, including the Mujoco and Atari games.
- In this process, introduced information bottlenecks and VAE to allow the model to achieve better results.

Image Segmentation of Breast Tumors   *Jul 2020 - Jun 2021*
- Developed a CNN model to automatically annotate the region of tumors in key frames of ultrasonoscopy (US) and ultrasonic videos (CEUS) of the breast, improving doctors' efficiency in the treatment.
- Utilized the segmentation of US to assist the division of tumor regions in the CEUS.

Competitions

30th Science & Technology Competition at Beihang University (*Second price*)   *Jan 2020 - May 2020*

Alert-situation Analysis and Alarm-Receiving Platform Based on Text-mining
- Developed a functional platform to automatically analyze cases and assist in case-solving.
- Realized the interaction between the front-end and back-end by delivering the typed information from the front-end to the analyzing interface to extract and classify keywords.

2019 CCF Computing Intelligence Contest (*CCF BDCI*)   *Sept 2019 - Nov 2019*

Quality Analysis of Discrete Work-pieces
- Designed a model to predict the quality of unknown work-pieces based on the known parts.
- Analyzed statistics with different machine learning models, and obtained the optimal results with fusion model.
- Ranked top 3% in over 2000 teams.

Engineering Project

Development of An Embedded Robot   *Mar 2020 - Jun 2020*
- Build an embedded robot with multiple functions, including voice control and capturing with manipulators.
- Realized voice control and active control based on controlling the movement of robots with different signals.

Data Analysis for Didi Chuxing   *Nov 2019 - Dec 2019*
- Studied data of Didi Chuxing in Haikou City and analyzed the travel experiences of users to predict future travels.
- Conducted k-means clustering analysis on departure spots and destinations individually and classified the two types of data to study the possibility of journeys happening from one departure spot to one destinations.
- Applied bigdata methods to calculate the possibility of journeys respectively to study the travel modes.

Telegram Recommendation Robot   *Jul 2019 - Sept 2019*
Supervisor: Fan Zhang from MIT
- Developed a conversational robot that could recognize users' intention and offer real-life recommendations.
- Added the registration function and verified the identity of users with SQL database and encryption.
- Enabled the software to recognize users' intentions with NLP.

Skills

Programming Python, LATEX, C/C++, R, Matlab...

Language Mandarin Chinese, English

Academic Services

Conference Reviewer CVPR, ICCV, ICLR, ECCV, ACMMM, 3DMV

Journal Reviewer TMM