Xiangshan Tan

College of Control Science and Engineering, Zhejiang University,
Hangzhou, Zhejiang, China

✉ vincent.tan5131@gmail.com

🌐 http://vincent-tann.github.io

Education

2020-2024 **Bachelor of Engineering, Zhejiang University** *Hangzhou,China*

Automation (major, Robotics Direction), College of Control Science and Engineering
- GPA: 3.98/4.0 (92.35/100)
- Rank: 2/122
- Courses and scores (H stands for honors class):

> *Robot Modeling and Control*(95), *Intelligent Mobile Technologies*(95), *Air-Robots*(93), *Introduction to Computer Vision*(98), *Artificial Intelligence and Machine Learning*(94), *Electric Circuit and Analog Electronic Technology*(97), *Signal Analysis and Processing*(96), *Principles of Automatic Control*(94), *Modern Control System*(92), *Intelligent Control*(98), *Calculus I(H)*(98), *Calculus II(H)*(94), *General Physics I(H)*(95), *General Physics II(H)*(100), *Probability and Mathematical Statistics*(98)

Advanced Honor Class of Engineering Education (ACEE, minor), Chu Kochen Honors College
- 40 elites out of over 2000
- Courses and scores:

> *Wheeled Mobile Robots and Enhanced Lab Training*(96), *Bipedal Mobile Robot Technology*(92), *Mathematical Modeling*(92), *Fundamentals of Data Structures*(90), *Principle of Engineering I*(93)

Research Experience

Jul - Nov 2023 **Robot Intelligence through Perception Lab(RIPL), TTI-Chicago** *Chicago,US*

Advised by: Prof. Matthew R. Walter

Research Assistant & Co-first Author: Proposed with collaborators *Transcribe3D*, a simple yet effective approach to interpreting 3D referring expressions, which converts 3D scene geometry and semantics into textual representations and takes advantage of the common sense reasoning capability of LLMs. Achieved state-of-the-art results on prominent benchmarks for 3D referential language. Undertook most of the work in implementing the model and conducting experiments. The paper "Transcribe3D: Grounding LLMs Using Transcribed Information for 3D Referential Reasoning with Self-Corrected Finetuning" has been accepted by LangRob @ CoRL 2023. Further work has been submitted to CVPR 2024.

Jan - Mar 2023 **Institute of Intelligent Systems and Control, Zhejiang University** *Hangzhou,China*

Advised by: Prof. Yue Wang

Research Assistant: Participated in the Quadruped Robot Dense Visual Perception with Sparse Supervision project. Proposed the solution with collaborators which used an implicit neural representation and RGB point cloud prior to render RGB images, depth maps, semantic segmentation maps and footfall moment maps in novel views. Took use of only 0.1% manual semantic annotation to achieve accuracy of 78.7% on segmentation task.

Oct - Dec 2022 **State Key Lab of CAD&CG, Zhejiang University** *Hangzhou,China*

Research Assistant: Benchmarked implicit neural methods such as NeuS against tradition SFM & MVS methods such as Colmap on 3D-reconstruction task of texture-less objects. Tuned NeuS to improve the performance in the case of few images, texture-less objects, and objects with non-Lambertian reflections.

Mar - Aug 2022 **Industrial Control Institute, Zhejiang University** *Hangzhou,China*

Advised by: Prof. Shan Liu and Prof. Yiping Feng

Leader of Student Research Training Program (SRTP) Group: Led the project of *Computer Vision-based 3D Follow-up Gluing System*. Designed and implemented a planning algorithm to glue moving objects on a conveyor belt with unknown surface shapes and velocity using a 6-joints manipulator. Utilized consecutive frames of RGBD images to estimate object velocity and reconstruct object surface, reducing systematic and random error in single frames from sensor. Participated in the CIMC ("Siemens Cup" China Intelligent Manufacturing Challenge) with this project and won the Grand Prize in East China area.

Projects

2023	**Course of *Air-Robots***

Course of *Air-Robots*

Assembled a quad-rotor UAV. Implemented linear controller and SE3 controller of quad-rotor UAV in both simulation and real world (with a set of motion capture device).

2022 **Course of *Bipedal Mobile Robot Technology(actually focused on basics of articulated robot)***

Implemented forward and inverse kinematics solvers and trajectory planners of a 6-joints industrial manipulator (in real world) and a *7-joints redundant robotic arm* (in CoppeliaSim). Enabled the 7-joints robotic arm to 'walk' on the wall of the space station by continuously swapping its base and end.

2022 **Course of *Wheeled Mobile Robots and Enhanced Lab Training***

Implemented A* path planning, RRT* path planning, dynamic window approach (DWA), iterative closest point (ICP) odometry and Extended Kalman Filter (EKF) state estimation in *simulation and real robot*.

2022-2023 ***Deep Learning Specialization (at Coursera)***

Received certificates of 4 deep learning courses taught by Andrew Ng at Coursera: (1)*Neural Networks and Deep Learning*, (2)*Improving Deep Neural Networks: Hyperparamter Tuning, Regularization and Optimization*, (3)*Convolutional Neural Networks* and (4)*Sequence Models.* Not only built MLP and implemented BP algorithm using merely Numpy, but also built popular DL models like Residual Network and FaceNet with Tensorflow and Keras and finished relevant tasks.

Honors and Awards

Nov 2023	**Phoenix Special Scholarship** (2 out of 162)	Phoenix Contact (China)
Dec 2023	**Guoqiang Scholarship** (1 out of 122)	Guangdong Guoqiang Public Welfare Foundation
Oct 2023	**Zhejiang University Scholarship - First Prize** (top 3%)	Zhejiang University
Oct 2023	**Outstanding Student**	Zhejiang University
Oct 2023	**Artistic and Athletic Achievement Award**	Zhejiang University
Jun 2023	**The 7th China University Rowing Championship, 4th place in M4x**	
		Federation of University Sports of China
Dec 2022	**Huawei Elite Scholarship** (1 out of 122)	Huawei Technologies Co., Ltd.
Oct 2022	**National Scholarship** (top 0.2% of university students across China)	Ministry of Education of China
Oct 2022	**Zhejiang University Scholarship - First Prize** (top 3%)	Zhejiang University
Oct 2022	**Outstanding Student**	Zhejiang University
Oct 2022	**Student Leadership Award**	Zhejiang University
Oct 2022	**Artistic and Athletic Achievement Award**	Zhejiang University
Aug 2022	**"Siemens Cup" China Intelligent Manufacturing Challenge (CIMC), Grand Prize in East China area** (6 out of 147)	Organizing Committee of China Intelligent Manufacturing Challenge
Jan 2022	**Zhejiang Province Undergraduate Physics Innovation(Theory) Competition, First Prize**(top 3%)	
		Physical Society of Zhejiang Province
Oct 2021	**The 6th China University Rowing Championship, 4th place in M8+**	
		Federation of University Sports of China
Oct 2021	**Zhejiang University Scholarship - Second Prize**	Zhejiang University
Oct 2021	**Student Innovation and Entrepreneurship Award**	Zhejiang University
May 2021	**Zhejiang Province Undergraduate Advanced Mathematics Competition, Second Prize**	
		Mathematical Society of Zhejiang Province

Skills

Programming   **Python** (Advanced), **MATLAB/SIMULINK** (Proficient), **C/C++** (Proficient)

Tools   **ROS** (Proficient), **CoppeliaSim** (Proficient), **TensorFlow/Keras** (Proficient), **Matplotlib** (Advanced), **OpenCV**(Proficient), **OpenAI-API** (Proficient), **Pyside2**(Intermediate)

Volunteer Teaching

2022 Taught physics and career planning at a high school in Anji County, a impoverished area in Zhejiang, China, helping students improve their academic performance and plan ahead for their university major selections.

2020-2021 Participated in the Little Poplar charity project, teaching math and science courses to children suffering from leukemia who were unable to attend school regularly. Conducted classes twice a week, for one year.

2018 Led a teaching team to a junior high school in Tibet, a relatively underdeveloped region in China with scarce educational resources. Taught geography and art. Initiated a book donation campaign after the teaching program in four schools in home city, Jinan, and sent over 5,000 books to Tibet after careful selection.