Huijie **ZHANG**

Graduate student in University of Michigan, Ann Arbor

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Education

Huazhong University of Science and Technology (HUST)

Wuhan, China

B.S. in Mechanical Engineering — *Sep.2016 - Jun.2020*

- GPA:3.9/4.0 (90.06/100)
- Core Modules: Calculus, Linear Algebra, Probability Theory, Theory of Machines and Mechanisms, Machine Design, Principles of Microcomputer, , etc.

University of Michigan, Ann Arbor (Umich)

Ann Arbor, U.S.

M.S.E in Mechanical Engineering — *Sep.2020 - Dec.2022(Expected)*

- GPA:4.0/4.0
- Core Modules: Linear Systems Theory, Robotics Operating System, Robot Kinematics and Dynamics, Robotic manipulation

University of Michigan, Ann Arbor (Umich)

Ann Arbor, U.S.

(Dual degree) M.S.E in Electrical and Computer Engineering — *Jan.2021 - Dec.2022(Expected)*

- GPA:4.0/4.0
- Core Modules: Probability and Random Process, Computer Vision, Machine Learning, Reinforcement Learning

Publications

Conference

ProgressLabeller: Visual Data Stream Annotation for Training Object-Centric 3D Perception
Xiaotong Chen, **Zhang, Huijie**, Zeren Yu, Stanley Lewis, Odest Chadwicke Jenkins
The 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2022) — *Kyoto, Japan*
URL: `https://arxiv.org/pdf/2203.00283.pdf` — 2022

ClearPose: Large-scale Transparent Object Dataset and Benchmark
Xiaotong Chen, **Zhang, Huijie**, Zeren Yu, Anthony Opipari, Odest Chadwicke Jenkins
Proceedings of the 17th European Conference on Computer Vision (ECCV 2022) — *Tel-Aviv, Israel*
URL: `https://arxiv.org/pdf/2203.03890.pdf` — 2022

Workshop

TransNet: Category-Level Transparent Object Pose Estimation
Zhang, Huijie, Anthony Opipari, Xiaotong Chen, Jiyue Zhu, Zeren Yu, Odest Chadwicke Jenkins
Proceedings of the 17th European Conference on Computer Vision Workshops (ECCVW 2022) — *Tel-Aviv, Israel* — 2022

Research Experience

TransNet: Category-Level Transparent Object Pose Estimation

Ann Arbor, U.S.

Researcher, Advised by Prof. Chad Jenkins, University of Michigan, Ann Arbor — *Apr. 2022 - Sep. 2022*

- Publish on **ECCV 2022 workshop**; Submitted to ICRA 2023
- Came up with the idea of TransNet: a two-stage pipeline that estimates category-level transparent object pose using localized depth completion and surface normal estimation.
- Explored importance of depth completion and surface normal estimation through ablation studies.
- Explored influence of embedding method on transparent objects (tackling noise depth modality).

Clearpose: Large-scale Transparent Object Dataset and Benchmark

Ann Arbor, U.S.

Researcher, Advised by Prof. Chad Jenkins, University of Michigan, Ann Arbor — *Dec. 2021 - Mar. 2022*

- Publish on **ECCV 2022**;
- Participated in objects' instances and categories selection, data collection;
- Came up with a transparent object pose annotation pipeline, annotated part of the dataset;
- Benchmarked the transparent object pose estimation on Clearpose dataset;

ProgressLabeller: Visual Data Stream Annotation for Training Object-Centric 3D Perception

Ann Arbor, U.S.

Researcher, Advised by Prof. Chad Jenkins, University of Michigan, Ann Arbor — *Jun. 2021 - Mar. 2022*

- Publish on **IROS 2022**;
- Implemented the whole pipeline in Blender, ensured user-friendly for object pose annotation;
- Came up with the idea of using multi-view silhouette guidance, achieving higher 3D pose accuracy than previous benchmarks;
- Used state-of-art pose estimation method as a baseline for robot manipulation experiment, demonstrated the improved accuracy of our pose annotation pipeline;

Deep reinforcement learning on Minecraft

Ann Arbor, U.S.

Researcher, Advised by Prof. Honglak Lee, University of Michigan, Ann Arbor — *Jan. 2021 - Apr. 2021*

- Implemented Deep Q-learning from demonstration (DQFD) in Pytorch;
- Deployed DQFD on the computer game, Minecraft, exploit its potential to learn tree chopping in the game ;
- Achieveed a reasonable result, 39.28 trees per iteration, compared with 64 trees per iteration for human players ;

Intelligent mobile robot designed for tennis recognition and collection

Wuhan, China

Team Leader, advised by Lecturer Ling Ling, HUST — *Nov. 2018 - Nov. 2019*

- Used laser cutting machine, lathe, miller, drill machine to process car overall frame;
- Designed a collection by sweeping the ball, to collect 1 ball per 3 seconds without damage;
- Based on Arduino, controlled the movement and ball picking of the car by PID algorithm;
- Based on Raspberry Pi, realize visual algorithms for the car through Python and OpenCV;
- Developed mobile phone software based on MIT App Inventor, remote control car operation.

Undergraduate Research, Pneumatic soft robot module

Wuhan, China

Researcher, Advised by Prof. Zhigang Wu, HUST — *Jan. 2018 - Apr. 2018*

- Designed the structure of the soft robot that can flexibly double its cross-sectional area or double its length;
- Applied 3D printing to print the shell of the model and produced the soft robot by applying lost wax casting, optimized its manufacturing technology, and raised the manufacturing success rate from 30% to 80%;
- Enabled the multiple modules robot to enter narrow entrances freely, working as a pipe crawler or a pipe dredge.

Work Experience

Graduate Student Research Assistant

Ann Arbor, U.S.

The Laboratory for Progress, Advised by Prof. Chad Jenkins, University of Michigan, Ann Arbor — *Jun. 2021 - Sep. 2022*

- Worked on robot manipulation and object pose estimation.
- Solved the problem of transparent object perception and manipulation.

Wuhan Heavy Duty Machine Tool Group Corporation

Wuhan, China

Summer Intern, Technological Design — *Jul. 2019 - Aug. 2019*

- Set the process specifications of machine tool parts (vertical ram) as following;
- technological efficiency analysis: deleted some convex plate structures, improved parts efficiency on the premise of guaranteeing the performance;
- Decided the process route: guaranteed the straightness and flatness of parts processing;
- Used AutoCAD to draw process card.

Skills

Programming	C++, MATLAB, Python (Numpy, Pytorch), ROS
Hardware	C51, Arduino, STM32, Raspberry pi
Mechanical Software	ANSYS, SolidWorks, Inventor, Adams, and AutoCAD
Certificate	NCRE (National Computer Rank Examination) Certificate of Level 2, Certificate of CAXC
Languages	Chinese, English

Honors & Awards

2019	**Top 10%,** National Encouragement Scholarship	*Wuhan, China*
2019	**Top 10%,** China Railway Equipment Scholarship	*Wuhan, China*
2018	**2ed Prize,** National College Students Mechanical Innovation Design Competition	*Wuhan, China*
2018	**3rd Award,** Mathematical Contest in Modeling(MCM)	*Wuhan, China*