

Yuhang Zheng

School of Mechanical Engineering and Automation, Beihang University, Beijing

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Education

Beihang University

Beijing, China

Academic Master in Mechanical Engineering | Advisor: **Prof. Meiqing Wang**

Sept 2022 - Jun 2025

- GPA: 3.80 / 4
- Thesis Title: An Automatic Parsing Method of Multi-modal Welding Process Files Based on Deep Learning.

Beihang University

Beijing, China

Bachelor in Mechanical Engineering (National First-class Discipline Program)

Sept 2018 - Jun 2022

- GPA: 3.64 / 4
- Thesis Title: An Automatic Extraction Method of Welding Process Elements Based on Chinese Named Entity Recognition.

Awards

Awards during Undergraduate and Graduate Studies

- National Scholarship (**top 2%**), 2024.
- Outstanding Postgraduate Student Award, Beihang University, 2024.
- "Alumnus of Beihang University" Scholarship, Beihang University, 2023.
- Outstanding Graduate Award, Beihang University, 2022.
- First Prize of the Chinese Mathematics Competitions for Undergraduates, Chinese Mathematical Society, 2021.

Research Interest

My **long-term research goal** is to build agents that efficiently understand the physical world. These agents will then apply their knowledge to interact with the physical world, fostering adaptability and enabling continuous skill acquisition.

Computer Vision 3D scene understanding; Monocular geometry estimation; 3D Reconstruction.

Robotics Language-guided manipulation, 3D Representation for Robotics.

Research Experience

ECE, Hong Kong University of Science and Technology

Beijing, China

Research Intern @ **UST.ECE** | Advisor: **Dr. Xiaoxiao Long** and **Prof. Ping Tan**

Apr 2024 - Current

- **Topic:** Monocular geometry estimation; Robotic manipulation.

EncoSmart Company

Beijing, China

Research Intern @ **EncoSmart** | Advisor: **Dr. Xiaoxiao Long** and **Dr. Chao Yang**

Jan 2024 - Current

- **Topic:** Language-guided grasping; 3D Reconstruction.

AIR, Tsinghua University

Beijing, China

Research Intern @ **DISCOVER Lab** | Collaborator: **Dr. Xiaoxiao Long** and **Dr. Chao Yang**

Aug 2021 - Jan 2024

- **Topic:** 3D scene understanding; Robotic manipulation; Autonomous driving; Mechanical structure design.

SMEA, Beihang University

Beijing, China

Research Intern @ **Robotics Institute** | Advisor: **Prof. Huichao Deng** and **Prof. Wei Wang**

Sept 2020 - Dec 2021

- **Topic:** Micro flapping-wing aircraft; Dental implant robot; Mechanical structure design.

Publications

(* denotes equal contribution; † denotes corresponding author.)

JOURNAL ARTICLES

GaussianGrasper: 3D Language Gaussian Splatting for Open-vocabulary Robotic Grasping

Yuhang Zheng, Xiangyu Chen, Yupeng Zheng, Songen Gu, Runyi Yang, Bu Jin, Pengfei Li, Chengliang Zhong, Zengmao Wang, Lina Liu, Chao Yang, Dawei Wang, Zhen Chen, Xiaoxiao Long†, Meiqing Wang†

RA-L, 2024

Adaptive Surface Normal Constraint for Geometric Estimation from Monocular Images

Xiaoxiao Long*, **Yuhang Zheng***, Yupeng Zheng, Beiwen Tian, Cheng Lin, Lingjie Liu, Hao Zhao†, Guyue Zhou, Wenping Wang†

IEEE TPAMI, 2024

ECT: Fine-grained Edge Detection with Learned Cause Tokens

Shaocong Xu, Xiaoxue Chen, **Yuhang Zheng**, Guyue Zhou, Yurong Chen, Hongbin Zha, Hao Zhao†

Image and Vision Computing, 2024

Lift System Optimization for Hover-capable Flapping Wing Micro Air Vehicle

Shengjie Xiao, Yongqi Shi, Zemin Wang, Zhe Ni, **Yuhang Zheng**, Huichao Deng†, Xilun Ding
Frontiers of Mechanical Engineering, 2024

CONFERENCE PROCEEDINGS

TOD3Cap: Towards 3D Dense Captioning in Outdoor Scenes

Bu Jin, Yupeng Zheng†, Pengfei Li, Weize Li, **Yuhang Zheng**, Sujie Hu, Xinyu Liu, Jinwei Zhu, Zhijie Yan, Haiyang Sun, Kun Zhan, Peng Jia, Xiaoxiao Long, Yilun Chen, Hao Zhao
ECCV, 2024

Monoocc: Digging into Monocular Semantic Occupancy Prediction

Yupeng Zheng, Xiang Li, Pengfei Li, **Yuhang Zheng**, Bu Jin, Chengliang Zhong, Xiaoxiao Long, Hao Zhao, Qichao Zhang†
ICRA, 2024

Enhancing Daily Life through an Interactive Desktop Robotics System

Yuhang Zheng, Qiyao Wang, Chengliang Zhong†, He Liang, Zhengxiao Han, Yupeng Zheng
CICAI, Best Demo Award, 2023

3D Implicit Transporter for Temporally Consistent Keypoint Discovery

Chengliang Zhong, **Yuhang Zheng**, Yupeng Zheng, Hao Zhao†, Li Yi, Xiaodong Mu, Ling Wang, Pengfei Li, Guyue Zhou, Chao Yang, Xinliang Zhang, Jian Zhao
ICCV, Oral, 2023

DPF: Learning Dense Prediction Fields with Weak Supervision

Xiaoxue Chen, **Yuhang Zheng**, Yupeng Zheng, Qiang Zhou, Hao Zhao†, Guyue Zhou, Ya-Qin Zhang
CVPR, 2023

Int2: Interactive Trajectory Prediction at Intersections

Zhijie Yan, Pengfei Li, Zheng Fu, Shaocong Xu, Yongliang Shi, Xiaoxue Chen, **Yuhang Zheng**, Yang Li, Tianyu Liu, Chuxuan Li, Nairui Luo, Xu Gao, Yilun Chen, Zuoxu Wang, Yifeng Shi, Pengfei Huang, Zhengxiao Han, Jirui Yuan, Jiangtao Gong, Guyue Zhou, Hao† Zhao
ICCV, 2023

Steps: Joint self-supervised Nighttime Image Enhancement and Depth Estimation

Yupeng Zheng, Chengliang Zhong, Pengfei Li, Huan-ang Gao, **Yuhang Zheng**, Bu Jin, Ling Wang, Hao Zhao, Guyue Zhou, Qichao Zhang†, Dongbin Zhao
ICRA, 2023

Adapt: Action-aware Driving Caption Transformer

Bu Jin, Xinyu Liu, Yupeng Zheng, Pengfei Li, Hao Zhao†, Tong Zhang, **Yuhang Zheng**, Guyue Zhou, Jingjing Liu
ICRA, 2023

INVENTION PATENT

Automatic Recognition Method for Groove Form and Joint Type of Welding Groove Schematic Diagram

Meiqing Wang, **Yuhang Zheng**, Zijian Wu, Chenhao Ye, Hao Luo
Chinese Invention Patent, Substantive Examination. CN117102738A, 2023

Automatic Groove Size Information Analysis Method for Welding Groove Schematic Diagram

Meiqing Wang, **Yuhang Zheng**, Zijian Wu, Hao Luo, Chenhao Ye
Chinese Invention Patent, Substantive Examination. CN117133010A, 2023

Process Knowledge Element Extraction Method for Welding Process Text

Meiqing Wang, **Yuhang Zheng**, Jinjian Duan
Chinese Invention Patent, Substantive Examination. CN115577709A, 2023

Flapping Wing Elastic Energy Storage Mechanism of Miniature Bionic Flapping Wing Aircraft

Huichao Deng, Zhe Ni, Zemin Wang, **Yuhang Zheng**, Yongqi Shi, Shutong Zhang
Chinese Invention Patent, Patent Grant. CN113148145B, 2022

Bionic Flapping Mechanism Applied to Hovering Type Micro Flapping Wing Aircraft

Huichao Deng, Yongqi Shi, **Yuhang Zheng**, Zemin Wang, Zhe Ni, Shutong Zhang
Chinese Invention Patent, Patent Grant. CN113148146B, 2022

Selected Projects

3D Generation of OmniSim Platform

OmniSim Organization | Advised by **Prof. Hao Dong**

In Progress

- **Method:** Given a task name, we first prompt LLM to enrich the task description to depict a scene and propose the relevant objects (description) with the proper size and location. Then, we build a text-image-3D pipeline to generate diverse 3D assets according to the proposed objects' descriptions.