

# Yuhang Zheng

School of Mechanical Engineering and Automation, Beihang University, Beijing

+86 188-1313-7601 | zhengyh021@gmail.com | MrSecant.github.io | github.com/MrSecant

## Education

### Beihang University

Beijing, China

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

Sept 2022 - Jun 2025

- GPA: 3.82 / 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: 3.67 / 4
- Thesis Title: An Automatic Extraction Method of Welding Process Elements Based on Chinese Named Entity Recognition.

### Awards

Awards during Undergraduate and Graduate Studies

- Outstanding Graduate Student Award, Beihang University, 2024.
- Glodon Scholarship (Alumni Scholarship), Beihang University, 2023.
- Outstanding Undergraduate Award, Beihang University, 2022.
- First Prize of the Chinese Mathematics Competitions, 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

### Lightillusions Company

Beijing, China

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

Apr 2024 - Current

- Topic:** Monocular geometry estimation; Language-guided manipulation.

### EncoSmart Company

Beijing, China

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

Jan 2024 - Current

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

### Institute for AI Industry Research (AIR), Tsinghua University

Beijing, China

Research Intern @ **DISCOVER Lab** | Advisor: **Prof. Hao Zhao** and **Prof. Guyue Zhou**

Aug 2021 - Jan 2024

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

### School of Mechanical Engineering and Automation (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-an 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

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### 3D Generation of OmniSim Platform

OmniSim Organization | Advised by **Prof. Hao Zhao** and **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.

## Skills

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**Programming** Python (PyTorch, NumPy, Scikit-learn. etc.), MATLAB, C/C#, HTML/CSS.  
**Tools** Linux, Git, Shell (Bash/Tmux),  $\text{\LaTeX}$ (Overleaf/Markdown), Slurm, Adobe Illustrator.  
**Language** Chinese (Native), English (Proficiency).