# Guowei Zhang

+86 138 1176 2159 | zgw21@mails.tsinghua.edu.cn | GitHub | Beijing, China

## Education

**Tsinghua University** — Beijing, China
*School of Software* — *Sep 2021 – Present*

- **Overall GPA:** 3.89/4.0
- **TOEFL Score:** 109 (Reading: 29, Listening: 28, Speaking: 24, Writing: 28)
- **Selected Courses:** Advanced Topics in Linear Algebra ($A^+$), Computer Organization Principle (A), Practice of Programming (A), Web Front-end Technology (A), Data Structure (A), Fundamentals of Digital Electronics (A), Physics (A), Introduction to Complex Analysis (A)
- **Programming Skills:** C/C++, Python, HTML+CSS, Assembly Language, Verilog

## Research Experiences

**Affordance Generalization for Robot Manipulation** — Embodied AI Lab, Tsinghua
*Advisor: Huazhe Xu* — *Sep 2023 – Present*

- Enabling robotic manipulation that generalizes to out-of-distribution scenes is a crucial step toward open-world embodied intelligence. While existing methods can predict affordance for familiar objects, they struggle to generalize to unseen objects.
- We extracted an affordance memory from human videos on the Internet. In facing unfamiliar objects, the robot can acquire affordance by retrieving the most similar object from the affordance memory, then map contact points from the retrieved object to the new one leveraging pre-trained diffusion models.
- I experimented with various retriever encoders to identify the one capable of finding the most similar image in the affordance memory, and evaluated the performance of different baselines on the dataset we collected.

**Enhancing Sample Efficiency for MBRL via World Model Optimization** — THUML, Tsinghua
*Advisor: Mingsheng Long* — *Oct 2022 – Jul 2023*

- Model-based reinforcement learning holds the promise of sample-efficient learning by utilizing a world model, which typically consists of components learning for two tasks: observation modeling and reward modeling.
- Observation models are subject to the environment's complexity and limited model capacity, while reward models are inadequate for sample-efficient learning without richer learning signals.
- We propose a simple yet effective method, Harmony World Models, that introduces a lightweight harmonizer to maintain a dynamic equilibrium between the two tasks in world model learning.
- I showcased the design principles, model structure and training process of some related works, and utilized Atari games as a benchmark to assess their performance.

## Publications

- Yuanchen Ju*, Kaizhe Hu*, **Guowei Zhang,** Gu Zhang, Mingrun Jiang, Huazhe Xu, "Robo-ABC: Affordance Generalization Beyond Categories via Semantic Correspondence for Robot Manipulation", currently under review.

## Internship

**Beijing YJK Building Software Co.,Ltd** — Beijing, China
*Intern, Graphics Platform Department* — *Aug 2023 – Sep 2023*

- Participated in the design and development of a Qt-based architectural software.

## Honors & Awards

- Academic Excellence Scholarship in Tsinghua University — *Sep 2023*
- Comprehensive Excellence Scholarship in Tsinghua University — *Sep 2022*