

Weijie Lyu

weijielyu.me • wlyu3@illinois.edu • Google Scholar • GitHub • LinkedIn

RESEARCH INTERESTS

My research interests mainly lie in computer vision and deep learning. The goal of my research is to explore how AI perceives the world and how to improve this ability inspired by human intelligence. Specifically, I am interested in the following topics:

- **General Purpose Vision:** Making vision systems scale up to numerous tasks using unified interfaces, with the ability to continually learn emerging concepts.
- **Few-shot / Zero-shot Learning:** Building strong recognition models by performing self-supervision on fewer labeled data or even unlabeled data.

EDUCATION

UNIVERSITY OF ILLINOIS, URBANA-CHAMPAIGN, Urbana-Champaign, IL

Aug. 2021 – Present

Master of Science, Computer Science

- GPA: 3.93/4.0
- Thesis Advisor: Prof. Derek Hoiem

SHANGHAI TECH UNIVERSITY, Shanghai, China

Sept. 2017 – July 2021

Bachelor of Engineering, Computer Science and Technology

- GPA: 3.64/4.0; Major Rank: 13/142
- Outstanding Graduate of Shanghai
- Outstanding Graduate of ShanghaiTech University
- Undergraduate Scholarship (top 15% of students), 2018; 2019; 2020
- Merit Student (top 5.6% of undergraduate students), 2018; 2019; 2020

UNIVERSITY OF CALIFORNIA, BERKELEY, Berkeley, CA

Aug. 2019 – May 2020

Berkeley-ShanghaiTech GLOBE Visiting Student Program

- GPA: 3.68/4.0
- Undergraduate researcher in Prof. Sonia Bishop's Lab.

PUBLICATIONS

Xu, Chejian, Wenhao Ding*, Weijie Lyu, Zuxin Liu, Shuai Wang, Yihan He, Hanjiang Hu, Ding Zhao, and Bo Li.*

"SafeBench: A Benchmarking Platform for Safety Evaluation of Autonomous Vehicles."

NeurIPS 2022

- Presented a benchmark which systematically evaluates the safety and robustness of autonomous driving (AD) algorithms based on diverse testing scenarios and comprehensive evaluation metrics. [*Website*]

Tan, Xianglong, Weijie Lyu, and Andre Rosendo.

"CircuitBot: Learning to survive with robotic circuit drawing."

Plos one 17, no. 3 (2022): e0265340.

- A robot which can construct an electrical path to access energy from a power source while avoiding potential obstacles and controlling the charging voltage. [*Paper*]

ACADEMIC SERVICES

CONFERENCE REVIEWER: *NeurIPS 2022*

RESEARCH PROJECTS

UNIVERSITY OF ILLINOIS, URBANA-CHAMPAIGN, Urbana-Champaign, IL Aug. 2021 – Present

Multi-modal Image Generation (Advisor: Prof. Derek Hoiem) June 2022 – Nov. 2022

- A geometry-aware generator for multi-modal image generation on complex scene dataset.
- Submitted to CVPR 2023

Visual Models Ensemble (Advisor: Prof. Derek Hoiem) June 2022 – Present

- Create an ensemble of big models under test-time budget that can work well for various datasets.

Sparse Mask Autoencoder (Advisor: Prof. Derek Hoiem) Sept. 2022 – Present

- Train mask autoencoders more efficiently with fewer patches by applying image preprocessing and patch sampling strategies.

Lane Boundaries Detection in Extreme Scenario (Advisor: Prof. David Forsyth) Aug. 2021 – Dec. 2021

- Used Canny edge-detection, Hough line detection, DBSCAN, etc. to accomplish lane boundaries detection and lane following task especially on sharply curved lanes.

UNIVERSITY OF CALIFORNIA, BERKELEY, Berkeley, CA Aug. 2019 – May 2020

Developmental Prosopagnosia and Autism-trait project (Advisor: Prof. Sonia Bishop) Jan. 2020 – Aug. 2020

- Classified and visualized eye tracker data into fixations, blinks, and saccades.
- Detected facial features and analyzed participants' fixations.

RoboArt (Advisor: Prof. S. Shankar Sastry) Oct. 2019 – Dec. 2019

- Designed a PID control system that allows a robot to draw a portrait / write Chinese characters with ROS.
- Designed a U-Net based architecture which are super-efficient for face segmentation.

SHANGHAITECH UNIVERSITY, Shanghai, China Sept. 2017 – July 2021

Senior Thesis (Advisor: Prof. Zhihao Jiang) Oct. 2020 – May 2021

- Constructed an intelligent driving verification platform based on SUMO (Simulation of Urban MObility) with Unity.
- Built non-player character vehicle with car-following model, lane change model, and ray detection.

EMPLOYMENTS

UNIVERSITY OF ILLINOIS, URBANA-CHAMPAIGN, Urbana-Champaign, IL Aug. 2021 – Present

Teaching Assistant, CS 100 Computer Science Orientation Aug. 2022 – Dec. 2022

- Instructor: Prof. Margaret M. Fleck

Research Assistant, Secure Learning Lab Aug. 2021 – Dec. 2022

- Advisor: Prof. Bo Li

RIMBLE, Berkeley, CA May 2019 – Aug. 2019

Internship

- A startup founded by my teammate at UC Berkeley.
- Extracted data from eSports videos and analyzed using OCR and other computer vision techniques.

SHANGHAITECH UNIVERSITY, Shanghai, China Sept. 2017 – July 2021

Teaching Assistant, CS150 Database and Data Mining Sept. 2020 – Jan. 2021

- Instructor: Prof. Lu Sun