Weijie Lyu

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RESEARCH INTERESTS

My research interests mainly lie in computer vision. 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.*
- *Zero-shot / Few-shots 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

SHANGHAITECH UNIVERSITY, Shanghai, China Sept. 2017 – July 2021
Bachelor of Engineering, Computer Science and Technology

- GPA: 3.67/4.0; Major Rank: 13/142
- Outstanding Graduate of Shanghai
- Outstanding Graduate of ShanghaiTech University
- *Undergraduate Scholarship* (top 15% of students), 2017-2018; 2018-2019; 2019-2020
- *Merit Student* (top 5.6% of undergraduate students), 2017-2018; 2018-2019; 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

SafeBench: A Benchmarking Platform for Safety Evaluation of Autonomous Vehicles (Website)
Chejian Xu, Wenhao Ding*, **Weijie Lyu**, Zuxin Liu, Shuai Wang, Yihan He, Hanjiang Hu, Ding Zhao, Bo Li*

- Published on NeurIPS 2022 Datasets and Benchmarks Track.
- Presented a benchmark which systematically evaluate the safety and robustness of autonomous driving (AD) algorithms based on diverse testing scenarios and comprehensive evaluation metrics.

CircuitBot: Learning to survive with robotic circuit drawing
*Xianglong Tan, **Weijie Lyu**, Andre Rosendo*

- Published on PLOS ONE.
- A robot which can construct an electrical path to access energy from a power source while avoiding potential obstacles and controlling the charging voltage.

ACADEMIC SERVICES

CONFERENCE REVIEWER: *NeurIPS 2022 Datasets and Benchmarks*

RESEARCH PROJECTS

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

Visual Models Ensemble (Advised by 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 (Advised by Prof. Derek Hoiem) — *Sept. 2022 – Present*

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

Lane Boundaries Detection in Extreme Scenario (Advised by Prof. David Forsyth) — *Aug. 2021 – Dec. 2021*

- Used Canny edge-detection, Hough line detection, DBSCAN, etc. to successfully accomplish lane boundaries detection and lane following task in Highbay backlot.
- Especially, our algorithm has significantly better performance than current state-of-the-art CNN approaches on sharply curved lanes.

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

Developmental Prosopagnosia and Autism-trait (DPA) project (Bishop Lab) — *Jan. 2020 – Aug. 2020*

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

ROBORT (Advised by 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.

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

Senior Thesis (in Cyber-Physical Systems (CPS) Lab \| Advisor: Prof. Zhihao Jiang) — *Oct. 2020 – May. 2021*

- Constructed an intelligent driving verification platform based on SUMO (Simulation of Urban MObility) with Unity.
- Built NPC vehicles control models, including car-following model, lane change model, and ray detection.

EMPLOYMENT

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

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

- Professor of the course: Margaret M. Fleck

Research Assistant, Secure learning lab — *Aug. 2021 – Jan. 2022*

- Advised by 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 for later analysis 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*

- Professor of the course: Lu Sun