QIUSHI LYU

Peking University

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EDUCATION

Bachelors of Computer Science (Turing Class)

Peking University

Sept. 2021 – Present Beijing, China

- GPA 3.92/4.00, **Rank 1/121**
- Gold medalist at the 2020 China National Olympiad in Informatics (NOI), leading to direct admission into Peking University.

Visiting Student

Massachusetts Institute of Technology

Mar. 2024 – Aug. 2024 Boston, US

- Advised by Prof. Joshua B. Tenenbaum and Prof. Chuang Gan.
- Specialized in Computer Vision and Embodied AI.

RESEARCH INTERESTS

Computer Vision
Embodied AI and Robotics
Multimodal Learning
Cognitive Science

LANGUAGES

Chinese: Native Speaker
English: TOEFL 105(Speaking 23), GRE 320

PUBLICATIONS (*DENOTES EQUAL CONTRIBUTION)

Constrained Human-AI Cooperation: An Inclusive Embodied Social Intelligence Challenge [link]
NeurIPS 2024 D & B Track

Authors: Weihua Du*, **Qiushi Lyu***, Jiaming Shan, Zhenting Qi, Hongxin Zhang, Sunli Chen, Andi Peng, Tianmin Shu, Kwonjoon Lee, Behzad Dariush, Chuang Gan

- We created a new benchmark, named CHAIC, to test embodied agents' ability to actively perceive human partners' intents and constraints from egocentric visual observations, and designed new agents with real physical constraints and some long-horizon tasks featuring both indoor and outdoor scenes.

COMBO: Compositional World Models for Embodied Multi-Agent Cooperation [link] **Submit to ICLR 2025**

Authors: Hongxin Zhang*, Zeyuan Wang*, **Qiushi Lyu***, Zheyuan Zhang, Sunli Chen, Tianmin Shu, Yilun Du, Chuang Gan

- **ICLR 2025 average review score 6 (6, 6, 6)**
- We introduced an embodied multi-agent planning framework that leverages a compositional world model to empower the agents to imagine how different actions may affect the world in the long run and plan more cooperatively. The compositional world model is learned by factorizing joint actions of agents and compositionally generating the future frames of the world state.

Add a title here **In Progress**

Authors: Sunli Chen*, **Qiushi Lyu***, Haotian Yuan*, Kaizhi Qian, Yang Zhang, Chuang Gan

- We created a pipeline to generate stereo sound from silent videos and used it to generate a high-quality video dataset with stereo sound. We trained a model on this dataset that jointly generates video and stereo sound given an initial frame.

MagnifierSketch: A Unified Data Structure for Efficient Aggregate and Per-Flow Latency Quantile Estimation
Submit to WWW 2025

Authors: Jiarui Guo*, **Qiushi Lyu***, Yuhan Wu*, Haoyu Li*, Tong Yang, Zhaoqian Yao, Yuqi Dong, Peiqing Chen, Xiaolin Wang

- We proposed MagnifierSketch, an efficient algorithm for per-flow latency quantile estimation, which is unbiased and significantly better than the state-of-the-art algorithms.

SELECTED PRIZES

May 4th Scholarship Dec. 2023
The best scholarship in Peking University, has equivalent status to National Scholarship

POSCO Asia Fellowship Dec. 2022
Comprehensive Excellent Award sponsored by POSCO

International Collegiate Programming Contest (ICPC) Asia-East Continent Final Contest Jul. 2022
Rank 4, Gold Medal

International Collegiate Programming Contest (ICPC) Shenyang Regional Contest Nov. 2021
Rank 1, Gold Medal, beat the future ICPC World Final Champion

China National Olympiad in Informatics (NOI) 2020 Aug. 2020
Rank 45, Gold Medal

EXPERIENCES

Research Intern

MIT-IBM Watson AI Lab, Massachusetts Institute of Technology

Aug. 2022 – Present | Boston, US / Remote

- Advised by Prof. Joshua B. Tenenbaum and Prof. Chuang Gan.
- Developed *COMBO*, an embodied multi-agent planning framework that leverages a compositional world model to empower the agents to imagine future actions and plan more cooperatively.
- Also Developed *CHAIC*, a new benchmark test embodied agents' ability to actively perceive human partners' intents and constraints from egocentric visual observations.
- Another work aimed to generate a high-quality video dataset with stereo sound and train a model on this dataset that jointly generates video and stereo sound given an initial frame.

Research Intern

Peking University

Jan. 2022 – July. 2022 | Beijing, China

- Advised by Prof. Tong Yang
- Focused on sketch algorithms, introduced MagnifierSketch, an efficient algorithm for per-flow latency quantile estimation.

TEACHING EXPERIENCE

Teaching Assistant: Discrete Mathematics and Structures(I) Fall 2023