Benhao Huang

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https://huskydoge.github.io/ | Google Scholar

EDUCATION

School of Electronics Information and Electrical Engineering, Shanghai Jiao Tong University   Sep 2021 – Present

B.ENG. in Computer Science and Technology (IEEE Honor Class), GPA: 93.14/100.00, 4.08/4.30, (Rank 5/127)

Relevant Coursework:

● **Computer Science:** Design and Analysis of Algorithms (A+), Computer Networks (A+), Operating System (A+), Programming Languages and Compilers (A+), Natural Language Processing (A+), Database System Technology (A+), Computer Vision (A+), Principles and Methods of Program Design (A+), Program Design Practice (A+), Introduction to Data Science (A+)

● **Mathematics:** Mathematical Analysis (A+), Linear and Convex Optimization (A+), Information Theory (A+), Complex Analysis (A+), Probability and Statistics (A+)

● **Additional Academic Pursuits:** Engaged in a dual degree program in Mathematics and Applied Mathematics. Coursework included: Complex Analysis, Abstract Algebra, Linear Algebra II

TOEFL: 107, S24, R27, L29, W27, **GRE**: V157, Q170, AW4.0

RESEARCH INTERESTS

● Multi-modal World Model, World Model-based Reasoning and Planning, VLM / LLM Agents

● Interpretability AI, Data Influence Analysis, Dataset Synthesis and Distillation

● Acceleration of Generative Model

PUBLICATIONS

● DCA-Bench: A Benchmark for Dataset Curation Agents [paper]

   Benhao Huang, Yingzhuo Yu, Jin Huang, Xingjian Zhang, Jiaqi W. Ma. **KDD DB Track Oral 2025**

● Contrasting Adversarial Perturbations: The Space of Harmless Perturbations [paper]

   Lu Chen, Shaofeng Li, ***Benhao Huang***, Fan Yang, Zheng Li, Jie Li, Yuan Luo. **AAAI 2025**

● Defining and Extracting Generalizable Interaction Primitives from DNNs. [paper | code]

   Lu Chen, Siyu Lou, ***Benhao Huang***, Quanshi Zhang. **ICLR 2024.**

SELECTED PROJECTS

PandoraV2: Towards General World Model with Natural Language Actions and Video States

In Progress (co-lead)   Advisor: Prof. Zhiting Hu   [code]   Jun 2024 – Present

● Diffusion Game Engine: Built an auto-regressive Image-to-Video (I2V) model capable of simulating 2D platformer games (e.g., Mario), allowing control of both characters and environmental elements using text inputs on the fly. Proposed and implemented window-slide conditioning to support the generation of game videos lasting longer than one minute.

● Video Diffusion Model Acceleration: Spearheaded a sub-project focusing on optimizing video diffusion for real-time game generation, achieving generation speeds of under 1 second per round.

● Complex Video Captioning: Led a sub-project aimed at enhancing video captioning for complex scenarios where even state-of-the-art visual language models tend to falter, ensuring more accurate descriptions.

● Large-Scale Training Data Pipeline: Designed and implemented a high-efficiency processing pipeline for video training data, processing over 10 million videos simultaneously, significantly improving the overall data quality and processing speed.

DCA-Bench: A Benchmark for Dataset Curation Agents

KDD DB Track Oral 2025 (1st author)   Advisor: Prof. Jiaqi Ma   [paper]   Jan 2023 – Present

● Identified a novel task for LLM agents – detecting dataset quality issues (e.g. cross-file discrepancy, hidden corruptions) for the purpose of automating AI training data curation – and developed the first benchmark for this task. We collected 221 instances and designed a four-level difficulty for more fine-grained analysis on agents' performance.

● Developed a LLM-based automatic evaluator for scalable evaluations, achieving a reliable and robust to self-preference or length bias demonstrated through comprehensive experiments.

● Led the project, conducting surveys, implementing code, completing experiments, and writings.

Defining and Extracting Generalizable Interaction Primitives from DNNs

ICLR 2024 Advisor: Prof. Quanshi Zhang [paper | code]   Sep 2023 – Jan 2024

● Ideated a method to extract shared interactions of different DNNs trained for the same task.

- Conducted contrast experiments, illustrating that the extracted interactions can better reflect common knowledge shared by different DNNs. These shared interactions can be further used to interpret the output from DNNs.
- Implemented the main experiment codes and engaged in algorithm design, deploying the GitHub repository.

RESEARCH EXPERIENCE

- Research Intern, MAITRIX Lab, University of California San Diego.   Apr 2024 – Present
Developed visual World Model with focus on game generation *Advisor: Prof. Zhiting Hu*
- Research Intern, Alignment Team, Moonshot AI   Mar 2024 – Jun 2024
Explored prompt priorities alignment of LLMs   *Advisor: Flood Sung, Yanan Zheng*
- Research Intern, TRAIS Lab, University of Illinois Urbana-Champaign   Nov 2023 – Present
Constructed a LLM Agent benchmark for dataset issue detection   *Advisor: Prof. Jiaqi Ma*
- Research Intern, XAI Lab, Shanghai Jiao Tong University   Apr 2023 – Jan 2024
Extracted common knowledge of different LLMs   *Advisor: Prof. Quanshi Zhang*

AWARDS

- National Scholarship (Top 0.2% nationwide, ranked 1/127 in my major)	2023 - 2024
- Rui Yuan-Hong Shan Scholarship (Top 2%), SJTU	2022 - 2023
- Shao Qiu Scholarship (Top 4%), SJTU	2021 - 2022
- Meritorious Winner of Mathematical Contest in Modeling	2022

OTHER

- Student Mentor for CS2612 Programming Languages and Compilers	2023 - 2024
- Student Mentor for CS2601 Convex Optimization	2023 - 2024
- Volunteer at Shanghai Marathon	2022 - 2024
- Member of the Outreach Department, SJTU Spark Program Student Association	2021 - 2022