Zhe He (Jack)

✉ Jackhe313@g.ucla.edu ⓞ github.com/JackHe313 ⬤ Jackhe313.github.io

EDUCATION

University of California, Los Angeles (UCLA)　　　　　　　　　　Expected Jun 2025
Bachelor of Science in Computer Science | Double Major: Applied Mathematics　　*Current GPA: 3.92/4.0*
Relevant Courses: Machine Learning, Advanced Deep Learning, Computer Vision, Reinforcement Learning, Natural Language Processing, Data Structure, Algorithms, Linear Algebra, Optimization, Probability & Statistics
Honors and Awards: Dean's Honors List (2021-2024); 8th place in UCLA ACM-ICPC Algorithms Contest (2022)

RESEARCH EXPERIENCE

Research on Embodied AI in Urban Spaces
Research Assistant, Advisor: Prof. Bolei Zhou, Bolei Zhou Lab, UCLA　　　　　　Mar 2024 – Present
- Applied large scale object extraction via **GPT-4o**, **Grounded Dino**, and **Grounded SAM** in the real world
- Reproduced real-world object distribution in the Embodied AI simulation platform, *MetaUrban*
- Integrated *MetaUrban* into Nvidia's Isaac Lab, successfully transferring and optimizing digital-human assets

Research on Generative Model Memorization and Fingerprinting
Research Assistant, Advisor: Prof. Cho-Jui Hsieh, Computational Machine Learning Lab, UCLA　　Mar 2023 – Present
- Conducted analysis of data memorization in generative models (**DDPM**, **GAN**), focusing on the layer-wise distribution of memorization scores using Vision Transformers (**ViTs**) and Convolutional Neural Networks (**CNNs**) encoders.
- Developed a novel training-free **fingerprinting** method for identifying generative models' architecture, leveraging layer-wise memorization score distributions, achieving SOTA performance on model identification accuracy

PUBLICATIONS

- Wayne Wu, Honglin He, Yiran Wang, Chenda Duan, **Jack He**, Zhizheng Liu, Quanyi Li, Bolei Zhou. (2024). *MetaUrban: A Simulation Platform for Embodied AI in Urban Spaces.* **NeurIPS 2024** (in submission)
- **Jack He**, Jianxing Zhao, Andrew Bai, Cho-Jui Hsieh. (2024). *Embedding Space Selection for Detecting Memorization and Fingerprinting in Generative Models.* **TMLR 2024** (in submission)

PROJECTS

Text Guided Image Editing using Diffusion
Project Leader　　　　　　　　　　　　　　　　　　　　　　　　　Jan 2024 – Mar 2024
- Developed an end-to-end image generation and editing framework using **PyTorch**
- Introduced a training-free, text-guided semantic object segmentation method utilizing **DiffEdit** (Diffusion-based semantic image editing), BLIP, and other text-to-image models, achieving state-of-the-art capabilities

EEG Signal Classification
Project Leader　　　　　　　　　　　　　　　　　　　　　　　　　Feb 2024 – Mar 2024
- Explored various architectures for EEG (Electroencephalography) signal analysis, including **CNN**, **RNN**, **Transformers**, and hybrid models to resolve the complex patterns of brain neural activities
- Evaluated the impact of various hyperparameters and augmentation, improving classification accuracy by 15%

Trip Budget Planning Web App
Software Product Sprint Participant, Google　　　　　　　　　　　　　　May 2022 – Aug 2023
- Developed a trip budget planning web app using **Java**, **JavaScript**, and **HTML/CSS**, improving data storage efficiency by 30% with Google Cloud integration
- Focused on **back-end development** and coordinated with the front-end team to create functionalities for efficient storage of user, trip, event, and budget data, doubling the system's capacity and boosting performance by 90%

TEACHING ACTIVITIES

Summer Institute: Introduction to Generative AI, UCLA
Teaching Assistant　　　　　　　　　　　　　　　　　　　　　　　Jul 2024 – Aug 2024
- Mentored over 100 students, led interactive discussions, and presented advanced AI technologies, resulting in a 30% improvement in learning outcomes
- Led the development and implementation of a **transformer**-based autocomplete system and chatbot, providing support and guidance for over 20 chatbot projects in various fields

SKILLS

Programming Languages: Python, C/C++, Java, JavaScript, SQL, HTML/CSS, MATLAB, R.
Frameworks & Libraries: PyTorch, TensorFlow, Keras, Scikit-learn, Pandas, NumPy, Node.js, React.
Tools: LaTeX, Git/GitHub, Shell, AWS, Anaconda, Docker, Google Cloud Platform, Azure.