Zhe He (Jack)

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EDUCATION

University of California, Los Angeles (UCLA) Expected June 2025
Bachelor of Science in Computer Science | Double Major: Applied Mathematics *GPA: 3.92/4.0*
Relevant Courses: Machine Learning, Advanced Deep Learning & Neural Network, Computer Vision, Reinforcement Learning, Natural Language Processing, Data Structure, Algorithms, Linear Algebra, Optimization, Probability and Statistics
Honors and Awards: Dean's Honors List (2021-2025); 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
- Contributed to asset integration for *URBAN-X* and *MetaUrban*, developing and curating high-fidelity 3D digital assets.
- Led large-scale object extraction using **GPT-4o**, **Grounded DINO**, and **Grounded SAM**, ensuring real-world distribution for the simulation platforms. Building a scalable asset pipeline that enhanced realism and generalizability
- Integrated MetaUrban into Nvidia's Isaac Lab, successfully transferring and optimizing digital assets

Research on Generative Model Memorization and Fingerprinting
Research Assistant, Advisor: Prof. Cho-Jui Hsieh, Computational Machine Learning Lab, UCLA Mar 2023 – Sep2024
- 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, Chaoyuan Zhang, **Jack He**, Seth Z. Zhao, Ran Gong, Quanyi Li, Bolei Zhou. (2024). *Towards Autonomous Micromobility through Scalable Urban Simulation.* ***CVPR 2025***
- Wayne Wu, Honglin He, **Jack He**, Yiran Wang, Chenda Duan, Zhizheng Liu, Quanyi Li, Bolei Zhou. (2024). *MetaUrban: An Embodied AI Simulation Platform for Urban Micromobility*. ***ICLR 2025*** (spotlight)
- **Jack He**, Jianxing Zhao, Andrew Bai, Cho-Jui Hsieh. (2024). *Layer Choice for Memorization Detection and Fingerprinting for Generative Models.* ***Arxiv***

PROJECTS

Text-Guided Image Editing Framework
Project Leader Jan 2024 – March 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 Models Analysis
Project Leader Feb 2024 – March 2024
- Explored various architectures for Electroencephalography signal analysis, including **CNN**, **RNN**, **Transformers**, and hybrid models to resolve the complex patterns of brain neural activities

Trip Budget Planning Web App
Software Product Sprint Participant, Google May 2022 – Aug 2022
- 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 **backend 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 July 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, Shell, Docker, AWS, Google Cloud Platform, Azure