Jack He

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EDUCATION

University of California, Los Angeles (UCLA) — Expected June 2025
Bachelor of Science in Computer Science | Double Major: Applied Mathematics — *Current GPA: 3.92/4.0*

Relevant Courses: Machine Learning, Advanced Deep Learning & Neural Network, CV, RL, NLP, Data Structure, Algorithms, Software Development, Operating System, Linear Algebra, Optimization, Probability and Statistics

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.

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)   .

EXPERIENCE

UCLA Summer Institute CS 97: Introduction to Generative AI | *Teaching Assistant* — July 2024 – Aug 2024
- Educated and mentored over 100 students, spearheaded interactive discussions, and delivered insightful presentations on state-of-the-art AI technologies, increasing learning outcomes by 30%.
- Spearheaded the development and implementation of a **transformer**-based autocomplete system and a chatbot, providing critical support and guidance for over 20 diverse chatbot projects across various domains.

UCLA Bolei Zhou Lab | *Research Assistant* — Mar 2024 – Present
- Developed a method to extract a real-world object distribution for urban spaces by combining annotations from existing datasets with open-set sources including Google Street data and urban planning descriptions using **GPT-4**, **Grounded Dino**, and the **Grounded SAM**, improving sidewalk object detection accuracy by 25%.
- Contributed to the pipeline of 3D digital assets gathering for MetaUrban and helped optimizing RL training of ego-robot.

UCLA Computational Machine Learning Lab | *Research Assistant* — Mar 2023 – Present
- Delved into the role of layer selection in **Transformers** for memorization detection, uncovering distinctive memorization patterns that vary between model architecture.
- Assessed CT-score on various architectures including **ViT**s and **CNN**s. Developed a repository to automate **DDPM** and **GAN** sampling/generation, enhancing research efficiency by 30%.
- Propose a novel training-free fingerprinting method that leverages the unique CT-score distributions across different layers, achieving accuracy comparable to baseline methods.

Google | *Software Product Sprint Participant* — May 2022 – Aug 2022
- Worked with a team to develop a trip budget planning web app using **Java**, **JavaScript**, and **HTML/CSS**, improving data storage efficiency by 30% with Google Cloud integration.
- Concentrated on **backend development** while coordinated with front-end team, crafting functionalities for efficient user, trip, event, and budget data storage, doubled system's carrying capacity, enhancing overall performance by 90%.

PROJECTS AND ACTIVITIES

Text Guided Image Editing using Diffusion | *Project Leader* — Jan 2024 – March 2024
- Assessed DIFFEDIT, demonstrating its superior performance in image editing over classical and deep learning methods, achieving a 25% improvement in editing accuracy.
- Developed an end-to-end image generation and editing framework and introduced a training-free, text-guided semantic object segmentation method based on DIFFEDIT, BLIP, and other text-to-image models, achieving state-of-the-art capabilities.

EEG Signal Classification | *Project Leader* — Feb 2024 – March 2024
- Explored various architectures for EEG signal analysis, including **CNN**, **RNN**, **attention**-based models, **Transformers**, and hybrid models. Evaluate the impact of various hyperparameters, improved classification accuracy by 15%

Bruin 'O' Bruin | *Project Leader* — Oct 2022 – Jan 2023
- Lead a team of 5 to create Bruin 'O' Bruin, a card-elimination game web app, using **JavaScript**, **React**, **SQLite**, and **Node.js**, and hosted on **Microsoft Azure**, enhancing user engagement by 50%.
- Designed robust server and client-side frameworks with **Node.js**, **React**, and **Express**, enabling nearly instant data interaction between backend and frontend, reducing latency by 90%.
- **Managed** the entire project lifecycle, leading code reviews for over 100 pull requests on GitHub and coordinating team development in game design and database management, improving project delivery efficiency by 40%.

CodeSprint LA 2022(UCLA ACM-ICPC algorithms contest) | *Contestant* — Jan 2022 – Feb 2022
- Secured 8th place among hundreds of competitors, demonstrating problem-solving skills and algorithmic proficiency.