Zheyuan Kuang

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Education

The University of Sydney **Sydney, Australia**
Master of Philosophy (Engineering), Computer Science *Mar. 2025 – Mar. 2026*

- Supervisors: Dr. Zhanna Sarsenbayeva, A/Prof. Anusha Withana
- Thesis: Multimodal Emotion Elicitation and Recognition in Virtual Reality
- Research Interest: Human-Computer Interaction, Cognitive Science, Ubiquitous Computing, Affective Computing

The University of Nanchang **Nanchang, China**
Bachelor of Architecture *Sep. 2019 – Jun. 2024*

- Overall GPA: 3.46/4.0
- Relevant Coursework: Architectural Design, Urban Design, 3D Computer Aided Design, Environmental Psychology
- Merit Scholar (Top 20%) for 2020, 2021, 2022, and 2023

Publication

- **Kuang, Z.**, Li, T., Jiang, W., Mayer, S., Slim, F., Tag, B., Withana, A., Sarsenbayeva, Z. (2025). Understanding the Effects of Interaction on Emotional Experiences in VR. In Proceedings of the 2026 CHI Conference on Human Factors in Computing Systems.
- **Kuang, Z.**, Zhang, J., Li, Y., & Fukuda, T. (2025). Preserving architectural heritage in urban renewal: a stable diffusion model framework for automated historical facade generation. npj Heritage Science, 13(1), 256.
- **Kuang, Z.**, Zhang, J., Luo, X., Xie, Y. & Li, Y. (2024) Synthesizing User Preferences from Supplier Catalogs: A Large Multimodal Models Framework for Tailored Interior Design Solution. ACADIA2024
- Zhang, J., Xiang, R., **Kuang, Z.**, Wang, B., & Li, Y. (2024) ArchGPT: Harnessing Large Language Models for Supporting Renovation and Conservation of Traditional Architectural Heritage. Heritage Science, 12(1), 1-14.
- Xie, Y., Li, Y., Zhang, J., Zhang, J., & **Kuang, Z.** (2024). Analysis of Differences in Street Visual Walkability Perception Between DCNN and ViT Model Based on Panoramic Street View Images. ACCELERATED DESIGN - Proceedings of the 29th CAADRIA Conference, Singapore, 20-26 April 2024, Volume 2, Pp. 29–38.
- **Kuang, Z.**, Zhang, J., Huang, Y., & Li, Y. (2023) Advancing Urban Renewal: An Automated Approach to Generating Historical Arcade Facades with Stable Diffusion Models. HABITS OF THE ANTHROPOCENE - Proceedings of the 43rd ACADIA Conference - Volume II: Proceedings book one, University of Colorado Denver, Denver, Colorado, USA, 26-28 October 2023, pp. 616-625, CUMINCAD, 2023.

Work Experience

Casual Academic – Computer Science **May 2025 – Present**
School of Computer Science, The University of Sydney *Sydney, Australia*

- INFO3315 Human-Computer Interaction – Tutor

Research Assistant - Full Time **Aug 2024 – Feb 2025**
PolyU Technology and Consultancy Co. Ltd. (PTeC), The Hong Kong Polytechnic University *Hong Kong, China*

- Supporting Dr. Hee Sun Choi, Assistant Professor at the School of Design, in the research project "NEOM The LINE – Human-Centric Design within Vertical Urbanism (CR22-001)."
- Choi, H. S., Liang, X., Zhang, W., **Kuang, Z.** (2025). Facial Emotions in Physical Environments: Its Measurement and Mechanism. Building and Environment. (*Under Review*)
- Choi, H. S., Zhang, W., Liang, X., **Kuang, Z.** (2025). Evaluating Spatial cognition and Emotional Responses in High-Density Residential Community using Facial Recognition and Electroencephalogram. Environment and Behavior. (*Under Review*)

Research Experience

Deep Multimodal Emotion Recognition in Mixed Reality — Mar 2025 – Present

Supervisor: Dr. Zhanna Sarsenbayeva, A/Prof. Anusha Withana (The University of Sydney) — *Sydney, Austrailia*

- Conducted a user study (N=24) validating a high-arousal, high-valence VR scene, followed by a larger multimodal study (N=84) demonstrating that interaction modulates affective responses depending on scene context.
- Leveraging a Mixture-of-Experts (MoE) fusion architecture within a large language model (LLM) for multimodal emotion recognition from behavioral, physiological, and task performance signals collected in VR.

Co-Intelligent Assembly Workshop — Jun 2023 – Jul 2023

Supervisor: Prof. Peter Búš (Tsinghua University) — *Shanghai, China*

- Utilized C# to develop a Configurator, ML Agent and Masterbuilder classes in Unity, harnessing Reinforcement Learning and Imitation Learning to automate the generation of assembly templates for training machine learning agents within a collaborative design framework.
- Established a default training process with a reward system in a simulated environment, enhancing learning trajectories for ML agents and fostering improved autonomous decision-making in assembly tasks.
- Implemented inference learning upon training completion, enabling ML agents to apply precise assembly strategies, effectively merging virtual design processes with tangible applications.
- Utilized Design for Manufacture and Assembly (DFMA) practices with Grasshopper to devise a distribution system for component kits, leading to CNC and robotic production of a prototype architectural assembly space.

Phygital Space Narration Workshop — Aug 2023 – Sept 2023

Supervisor: Prof. Tiantian Lo (Hong Kong Polytechnic University) — *Nanchang, China*

- Developed a multisensory immersive experience using Arduino, Unity 3D, HoloLens, and Mixed Reality Toolkit 3, capturing and responding to users' emotions through touch and visual interactions.
- Collected and processed panoramic images to create a real-world scene dataset, and utilized CLIP Integrator to generate corresponding prompts for artworks.
- Applied Stable Diffusion XL and ControlNet models to generate artistic panoramas, and used GPT-4 and MusicGen to create emotion-tagged images and stylized music.
- Implemented a 360-degree panoramic view in Unity, integrating real and stylized images as materials.

Designing Data-Driven AI Synesthetic Models Workshop — May 2022 – Oct 2022

Supervisor: Prof. Hao Zheng (City University of Hong Kong) — *Shanghai, China*

- Investigated AI in architecture, urban planning, and the arts, gaining hands-on experience with algorithms like Pix2pix, CycleGAN, and CNN.
- Developed a sensory model using CycleGAN to blend real-world objects with ancient landscape paintings, and converted these images into traditional Chinese music through Python-generated MIDI files.
- Processed and prepared datasets for training, mastering data processing techniques for diverse data types and applications in AI synesthetic models.

Digital Design and Intelligent Construction Workshop — Oct 2021 – Sept 2022

Supervisor: Dr. Yitian Lu (Nanchang University) — *Nanchang, China*

- Led a team to develop a versatile robot tool hand, enhancing efficiency in intelligent construction.
- Executed experiments in robotic construction, developing key mechanical drawings and simulation programs.
- Designed over 30 wooden models and 8 3D printed replicas, resulting in an international patent application for a variable-caliber 3D printing extruder head (Patent No. 2022 10545903.2).

Awards and Honors

- University of Sydney CS HDR Research Support Fund (A$5,000) **2026**
- University of Sydney Postgraduate Research Support Scheme (A$1,800) **2025**
- 2nd Place, 1st National University Sound and Scenery Design Competition **2022**
- 3rd Place, 17th Challenge Cup Nanchang Uni. Academic & Tech. Work Competition **2021**

Technical Skills

Languages: Python, C/C#, R
Software: Rhino/Grasshopper, ArcGIS, AutoCAD, Revit, Blender, Unity, Photoshop, InDesign, Premiere, Figma