

Yukang Shen

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Research Interest: Cross-disciplinary spatial perception, physics-informed sensing, embodied intelligence for medical and healthcare scenario.

OBJECTIVE

Ph.D. applicant interested in high-precision spatial perception, low-cost physics-informed sensing, and embodied intelligence for real-world medical applications.

EDUCATION

Kennesaw State University, M.S. Software Engineering 2025.1 – Present
Graduate Research Assistant

Heilongjiang University, B.Eng. Computer Network Engineering 2016.9 – 2020.7
National Encouragement Scholarship; First-Class Scholarship (2018, 2019)

RESEARCH EXPERIENCE

Cross-Disciplinary Spatial Perception for Embodied Intelligence (Primary Research Interest)

- Investigating high-precision spatial perception that integrates optical cues, geometric priors, and multi-view consistency to support embodied agents in medical and healthcare environments.
 - Exploring physics-informed sensing methods—including structured illumination, surface normal estimation, and camera–light calibration—for millimeter-level anatomical understanding.
 - Studying how physics-derived signals (depth, normals, reflectance) can be fused with learned world models to enhance spatial accuracy, robustness, and generalization.
 - Long-term goal: build low-cost, high-fidelity sensing models enabling reliable and deployable embodied intelligence in real-world medical settings.

Synthetic-First Perception & Data Engines for Medical AI (Ongoing Research, manuscript in preparation)

- Developing a synthetic-first data engine combining diffusion-based generation, active learning, and geometry-driven pseudo labels to accelerate medical perception.
 - Creating parameterized rendering pipelines (pose, lighting, anatomy, occlusion) for controllable, high-diversity deltoid-injection datasets.
 - Evaluating synthetic→real transfer using AP shift, JS divergence, boundary accuracy, and downstream task performance.
 - Designing a modular pipeline supporting multi-view generation, 3D-aware segmentation, and domain adaptation for low-data medical perception.

Embodied AI Systems & Physical Reasoning (Supporting Direction)

- Building multi-stage perception systems (segmentation → keypoints → geometry → spatial reasoning) for safety-relevant medical scenarios.
 - Using open-vocabulary models and 3D scene-graph frameworks (ConceptGraphs, OpenMask3D) to structure environment understanding.
 - Investigating consistency, uncertainty, and interpretability for embodied agents performing spatially grounded tasks.

WORK EXPERIENCE

City University of Hong Kong, Research Assistant 2024.11 – 2025.1
Tech: Python, React
Developed an integrated Data Modelling Platform for research collaboration.

SenseTime Group Limited, Software Engineer 2020.11 – 2023.9
Tech: TypeScript, React, Electron, NodeJS, CV
Built internal AR navigation tools and enterprise platforms. **Best Employee of the Year 2021** in CIT.

PUBLICATION

6G-enabled Edge AI for Metaverse: Challenges, Methods, and Future Research Directions, JCN 2022

Type: Review Paper

Title and Author: Luyi Chang, Zhe Zhang, Pei Li, Shan Xi, Wei Guo, Yukang Shen, Zehui Xiong, Jiawen Kang, Dusit Niyato, Xiuquan Qiao, Yi Wu.

SKILLS

Python, JavaScript/TypeScript, React, NodeJS, PyTorch, CV/SLAM, 3D Vision, Data Engine