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Jasmine Lee

Human Computer Interaction Researcher
2nd year MS/PhD Student @ University of Massachusetts Amherst
Advisor: Dr. Ravi Karkar, Dr. Ali Sarvghad

Born and raised in Korea 🇰🇷

about

As a system researcher in Human-AI Interaction and Visualization, I embed generative and multimodal AI models into the design and evaluation of interactive systems that enhance accessibility and well-being. My work supports marginalized and underrepresented user groups—including Alzheimer's caregivers, people with disabilities, and older adults—in understanding data and navigating digital environments. I aim to bridge human insight and AI capability to make technology more interpretable, inclusive, and empowering.

I received a B.S in Computer Science and Engineering from Sungkyungkwan University and completed an exchange student program at the University of Texas at Austin. I have also worked as a Natural Language Processing(NLP) Researcher at Seoul National University Bundang Hospital and as a Machine Learning(ML) Engineer at Cipherome, Inc.

skills

Programming

Programming: Python, JavaScript (React.js, D3.js, Node.js), C/C++, R, Flask
Frameworks: PyTorch, TensorFlow
Databases: MongoDB, MySQL
Web Development: HTML, CSS, REST API Integration

Qualitative Methodologies

User Research, Semi-Structured Interviews, Prototyping, Usability Testing, Think-Aloud Protocol, Thematic Analysis

Quantitative Methodologies

Survey Design, Experimental Design, Statistical Analysis (R/Python), Modeling, Visualization Analysis

Tools

Development & Deployment: Git, GitHub, Docker, Vercel, Render, Capacitor
Design & Prototyping: Figma, Zeplin

projects

Research

1. Agentic Accessibility: A New Paradigm for Graphics Accessibility for Blind and Low-Vision
2. SVG Decomposition for Enhancing Large Multimodal Models Visualization Comprehension
3. From Text to Visuals: Using LLMs to Generate Math Diagrams with Vector Graphics
4. Carey: AI-Powered Mental Health App for Alzheimer's Caregivers
5. IoT Idge-Cloud: An Internet-of-Things Edge-Empowered Cloud System for Device management in Smart Spaces

Engineering

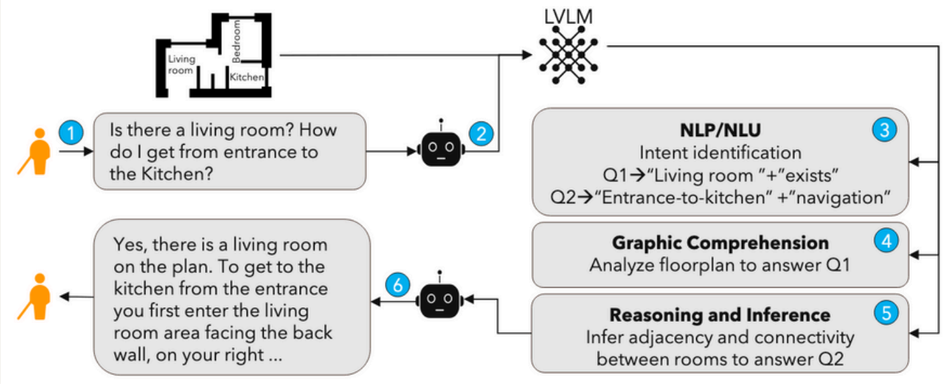
1. Location-based Augmented Reality rhythm game mobile application for K-pop concert promotion
2. Compass: Data analysis platform for clinicians
3. Model development that predicts lung cancer TNM stage using an Electronic Health Record dataset

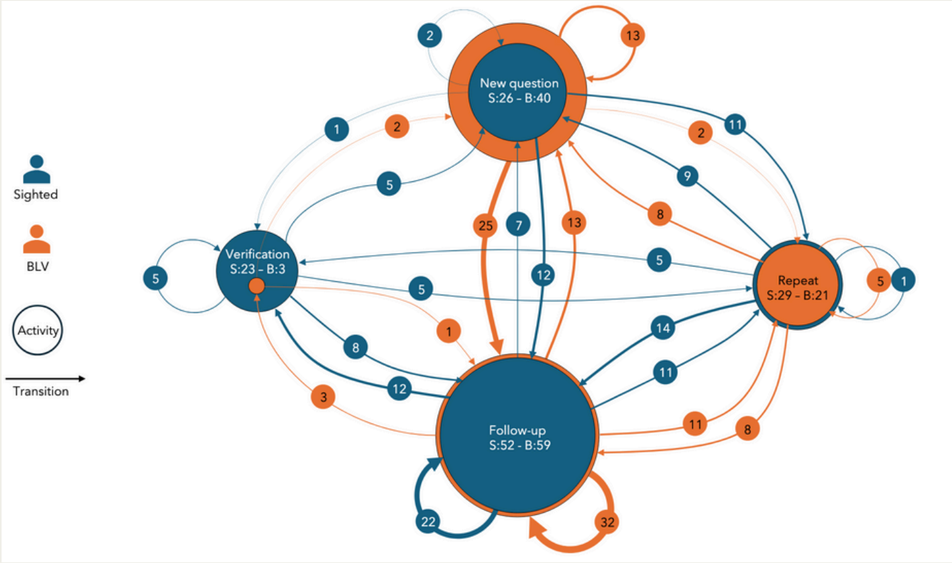
Agentic Accessibility: A New Paradigm for Graphics Accessibility for Blind and Low-Vision (CHI under review)

University of Massachusetts Amherst | Tufts Medical Center

Full paper link

Keywords: Human–AI collaboration · Accessibility design · Conversational agent · Empirical user evaluation





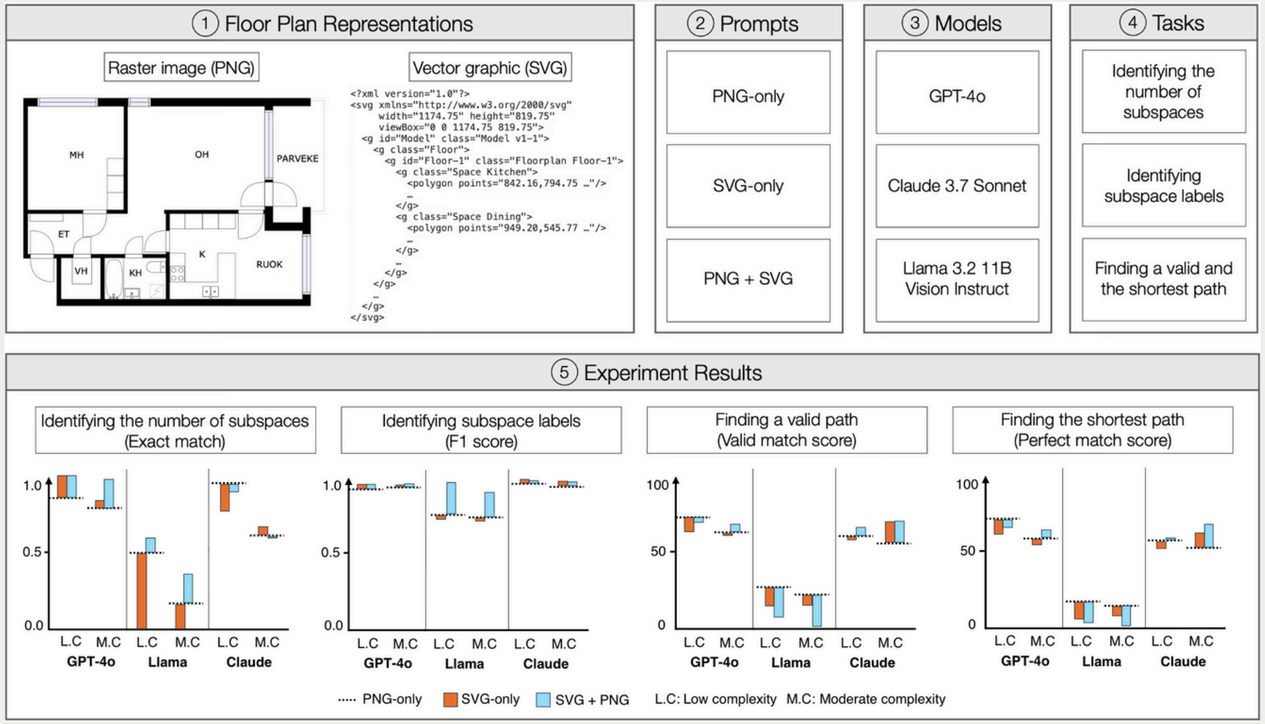
- **Problem**: Static alt-text prevents BLV users from exploring and understanding complex visuals like maps or floor plans.
- **Research Question**: How can conversational AI support blind users' spatial reasoning and exploration strategies when interacting with complex graphics?
- **Methodology**: Designed CONVERSIGHT, an Large Vision Language Model (LVLM)-powered conversational agent. Conducted a comparative user study (N=26) with 13 BLV and 13 sighted users, analyzing their query patterns and interaction strategies.
- **Findings & Contribution**: BLV users favored relational and self-directed exploration, revealing key UX patterns for designing adaptive, conversational accessibility systems.

SVG Decomposition for Enhancing Large Multimodal Models Visualization Comprehension (CHI under review)

University of Massachusetts Amherst

Full paper link

Keywords: LVLM evaluation · Data visualization · Experimental design · Multimodal reasoning

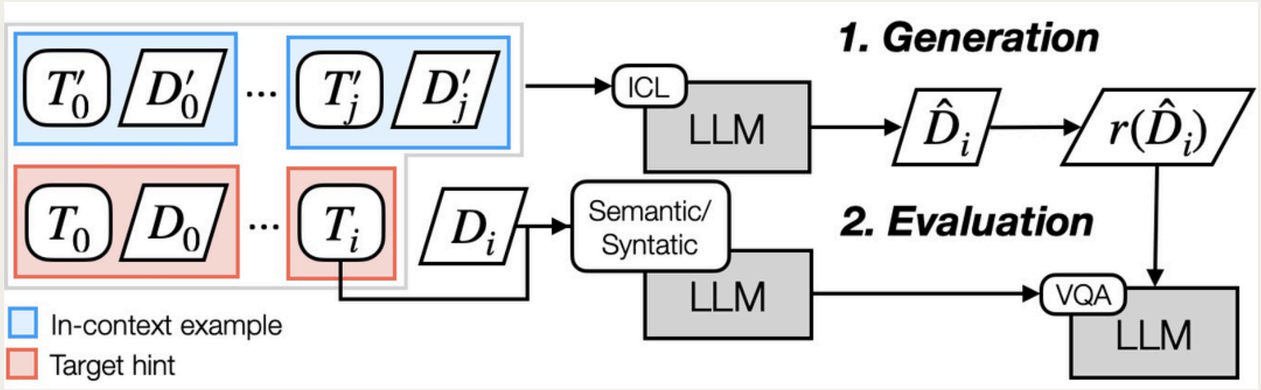


- **Problem**: Unclear how LMMs interpret visual structure—does understanding change between pixel (PNG) and vector (SVG) inputs?
- **Research Question**: How does input format influence an LVLM's ability to identify and reason about spatial structures?
- **Methodology**: Built a controlled evaluation of GPT-4o, Claude, and Llama on 75 floor plans across three formats (PNG, SVG, PNG+SVG), measuring four spatial tasks: counting, labeling, adjacency, and pathfinding.
- **Findings & Contribution**: Combining pixels and structure improved recognition but reduced reasoning accuracy, revealing key trade-offs in how multimodal AI interprets visual data.

From Text to Visuals: Using LLMs to Generate Math Diagrams with Vector Graphics (AIED 2025)

Full paper link

Keywords: LLM evaluation · Data visualization · Experimental design · Multimodal reasoning

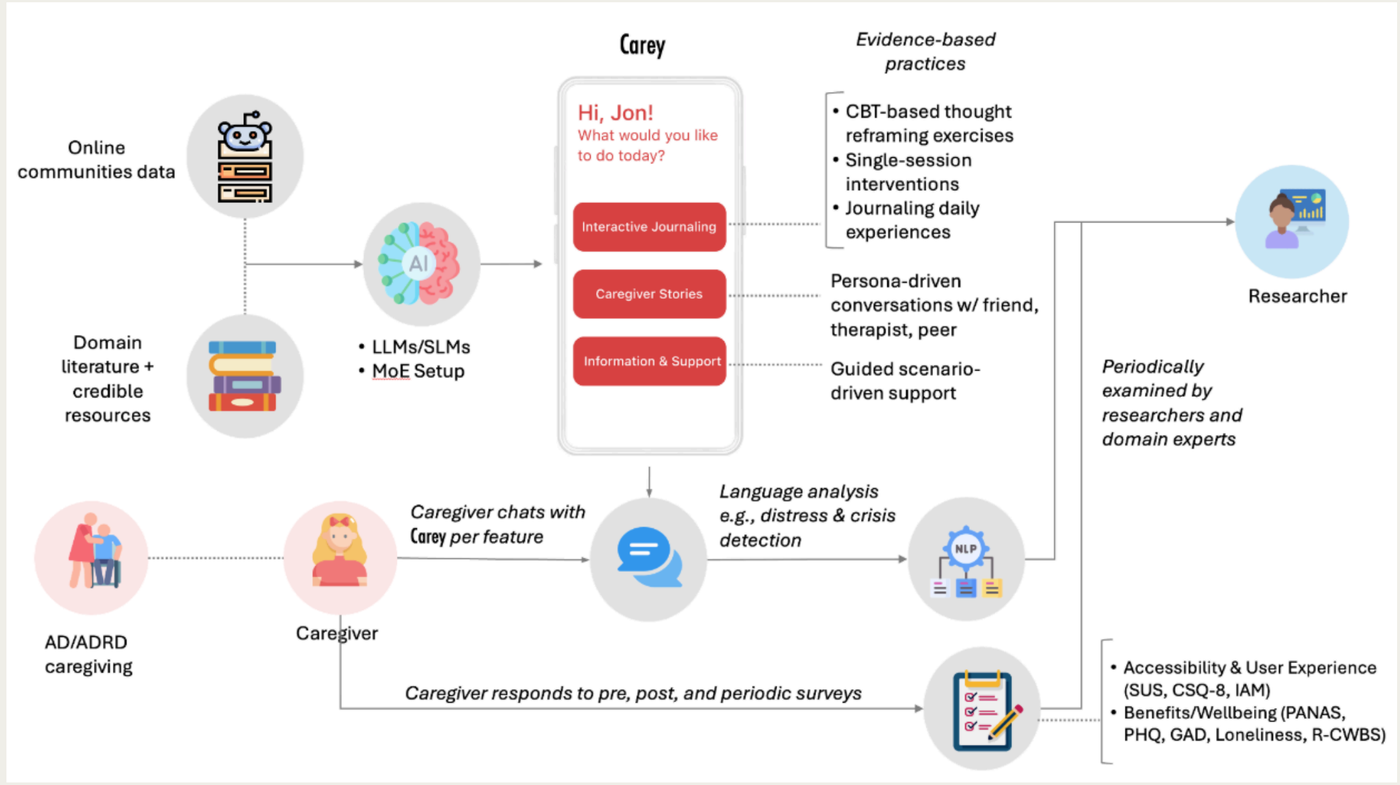


- **Problem**: Manually creating math diagrams is time-consuming for teachers and students struggle to understand abstract concepts from text-only hints.
- **Research Question**: Can LLMs generate mathematically accurate diagrams from text hints, and how do we evaluate quality at scale?
- **Methodology**: Developed an AI pipeline using in-context learning to generate SVG code directly from text hints. Designed a novel evaluation framework using a Visual Question Answering (VQA) model to autonomously grade the quality of the generated diagrams.
- **Findings & Contribution**: LLMs outperform image models (e.g., DALL·E) in producing precise SVGs. Introduced a scalable VQA evaluation method for assessing AI-generated visualizations.

Carey: AI-Powered Mental Health App for Alzheimer's Caregivers (On-going)

Prototype Link

Keywords: Digital Mental Health Tools · Conversational agent · Full-stack prototyping



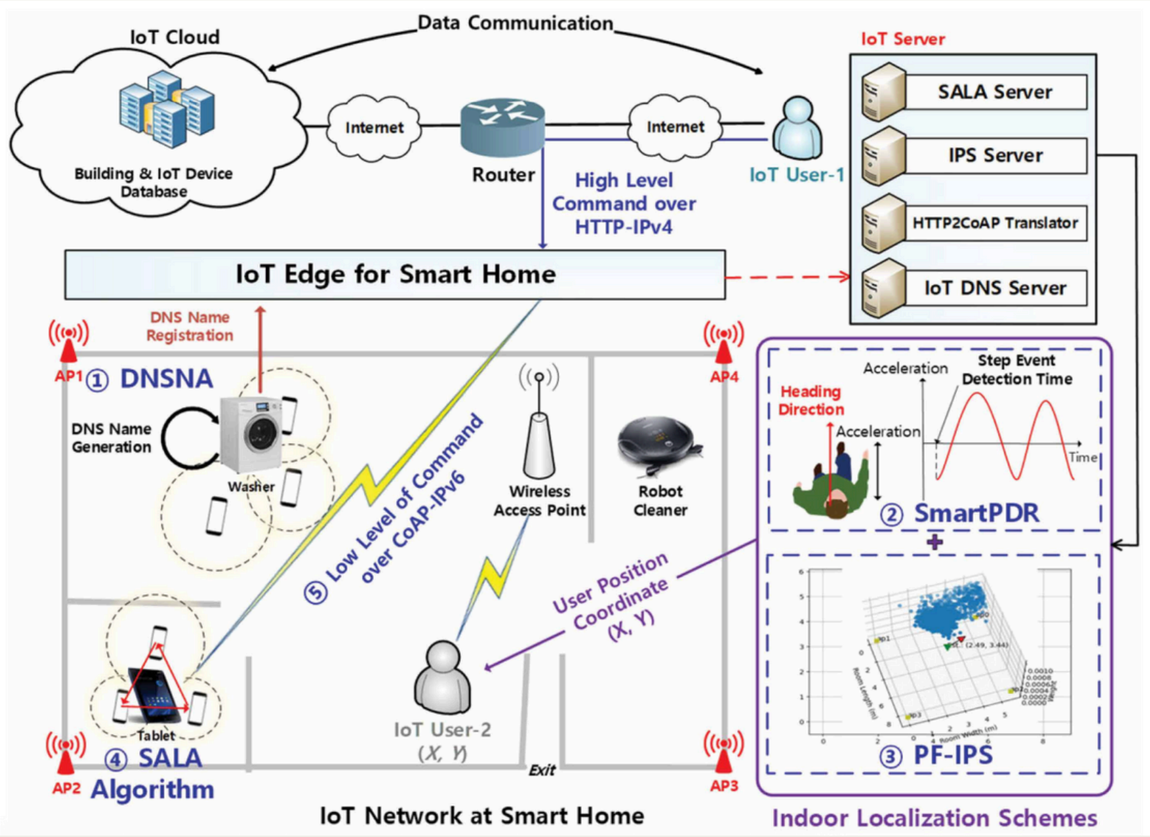
- **Problem**: Alzheimer's caregivers face chronic emotional and cognitive strain, requiring adaptive, multi-dimensional support.
- **Research Question**: How can we design a multi-agent AI system that recognizes caregivers' distinct emotional, cognitive, and informational needs and provides tailored, evidence-based support?
- **Methodology**: Developing Carey, a large language model–powered app integrating agents for venting, cognitive reframing, and reliable information retrieval. A clinician dashboard enables real-time review and iterative field evaluation.

IoT Idge-Cloud: An Internet-of-Things Edge-Empowered Cloud System for Device management in Smart Spaces (IEEE Network magazine)

SUNG KYUN KWAN UNIVERSITY

Full paper link

Keywords: User-centric IoT design · System prototyping · Data visualization · Experimental design



- **Problem**: Smart home apps list devices with cryptic names (e.g., Light-A24), making it hard for users to know where each device actually is.
- **Research Question**: How can we design a spatially-aware IoT interface that links digital controls to the physical locations of devices?
- **Methodology**: Developed IoT Edge-Cloud, integrating indoor localization (SALA, PF-IPS) and DNS Name Autoconfiguration (DNSNA) to automatically map and register devices. The app visualizes them on an interactive floor plan for direct control.
- **Findings & Contribution**: Users can manage devices visually by tapping them on a map instead of searching lists. The system achieved 1.08 m average localization error, demonstrating real-world usability for smart spaces.

work experience

2020 SK planet

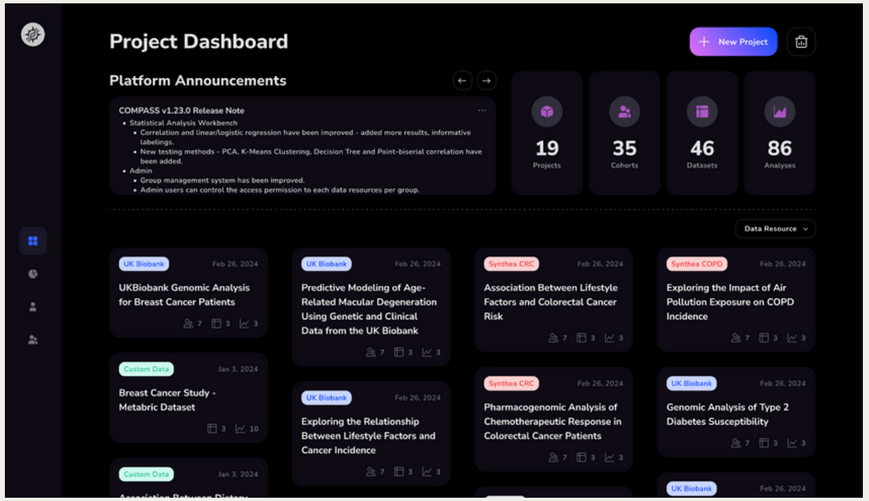
Industry-Academia Research Intern

- Designed “**AR Music Note**,” a location-based AR rhythm game that gamified the walk to the Busan One Asia Festival.
- Built using ARCore; designed UI/UX in Figma and mapped game triggers to GPS coordinates.
- Transformed a passive commute into an interactive brand journey, enhancing real-world user engagement.

2023 Cipherome

Machine Learning Engineer

- Developed “**COMPASS**”, a data analysis platform that enables clinicians to explore patient datasets (e.g., UK Biobank) without coding expertise.
- Built the ETL and ML pipelines in Python and designed the UI/UX wireframes for the platform.



2024 SNUH Seoul National University Bundang Hospital Biomedical Research Institute

NLP Researcher

- Developed a model that predicts lung cancer TNM stage using an Electronic Health Record dataset, collaborating closely with clinicians and data scientists to align model outputs with clinical needs.

why hire me

I Build to Think.

I rapidly prototype interactive, full-stack systems to test complex AI and accessibility interactions that static designs can’t capture. Building helps me ask sharper questions, uncover edge cases early, and collect high-fidelity insights from real users.

I Design Systems, Not Just Screens.

I focus on how data flow, model behavior, APIs, and UI converge into one cohesive experience. I design for the whole system—ensuring every layer, from backend logic to front-end interaction, contributes to an intuitive and resilient user experience.

I Validate with Rigorous Research.

My engineering is driven by evidence. I plan and run empirical user studies—both qualitative and quantitative—to evaluate the systems I build. This lets me validate design assumptions and prove that my technical solutions genuinely improve human experience.

Let's connect and design solutions that leave a lasting *impact*!

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Website
Linkedin
Google Scholar

References

- Dr. Ravi Karkar — Assistant Professor, University of Massachusetts Amherst rkarkar@umass.edu
- Dr. Ali Sarvghad — Lecturer, City St George's, University of London asarv@cs.umass.edu