Last updated: 10/30/2025

Jasmine Lee

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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), Java, C/C++, R, Kotlin
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

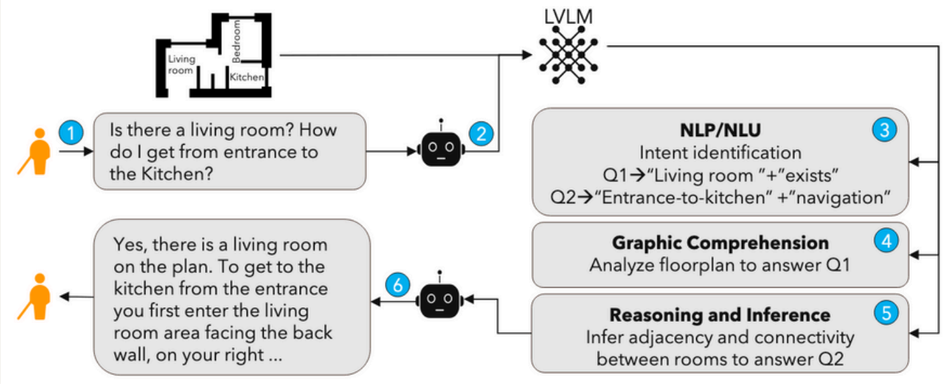
1. Location-based Augmented Reality rhythm game mobile application for K-pop concert promotion
2. Compass: Data analysis platform for clinicians
3. Model development that predicts lung cancer TNM stage using an Electronic Health Record dataset

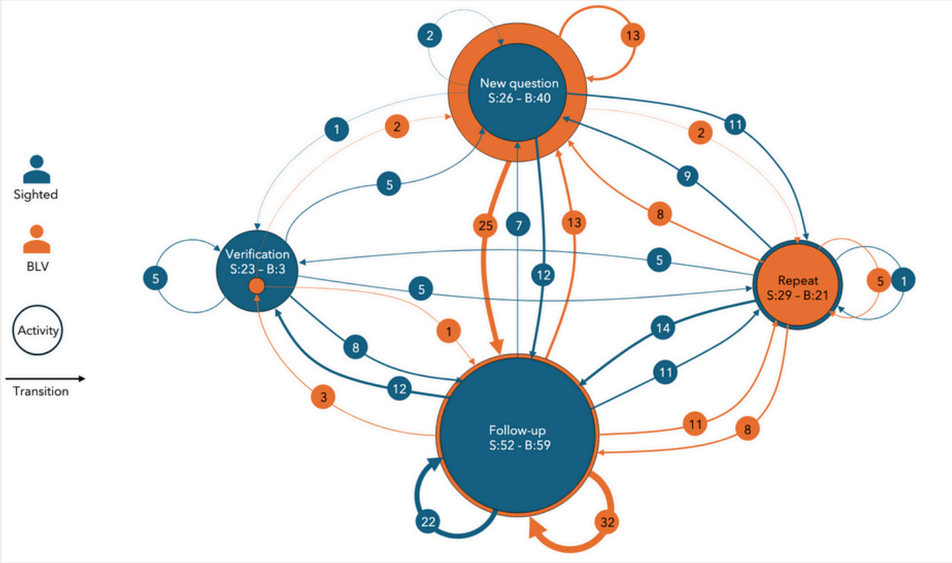
Agentic Accessibility: A New Paradigm for Graphics Accessibility for Blind and Low-Vision (CHI under review)

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 fails for complex graphics like charts, maps, and floor plans. BLV users cannot explore data, ask follow-up questions, or build an accurate mental model.
- **Research Question**: How can AI agents better serve blind users' unique exploration strategies when navigating complex spatial information?
- **Methodology**: Designed and prototyped "CONVERSIGHT," a conversational agent powered by a Large Vision-Language Model. I then 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 have fundamentally different exploratory strategies. They strongly prefer "Relational Questions" (e.g., "What is next to the kitchen?") and a "Cold Start" (no summary) approach. This provides key design guidelines for next-generation AI accessibility tools.

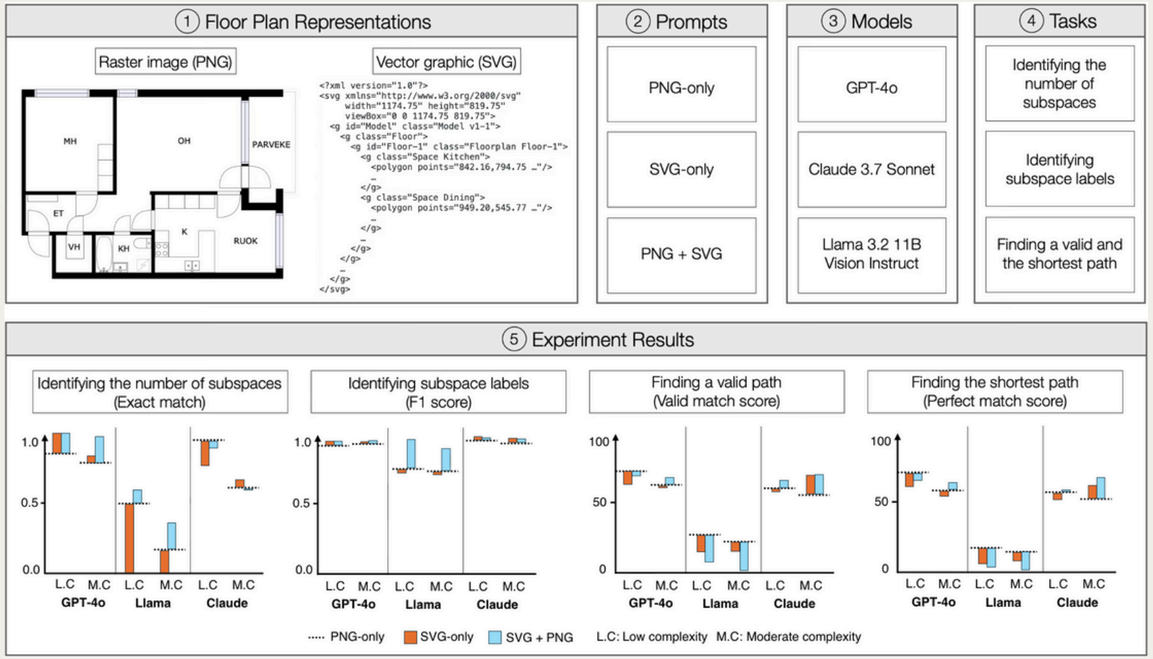
SVG Decomposition for Enhancing Large Multimodal Models Visualization Comprehension (CHI under review)

University of Massachusetts Amherst

HCVS

Full paper link

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

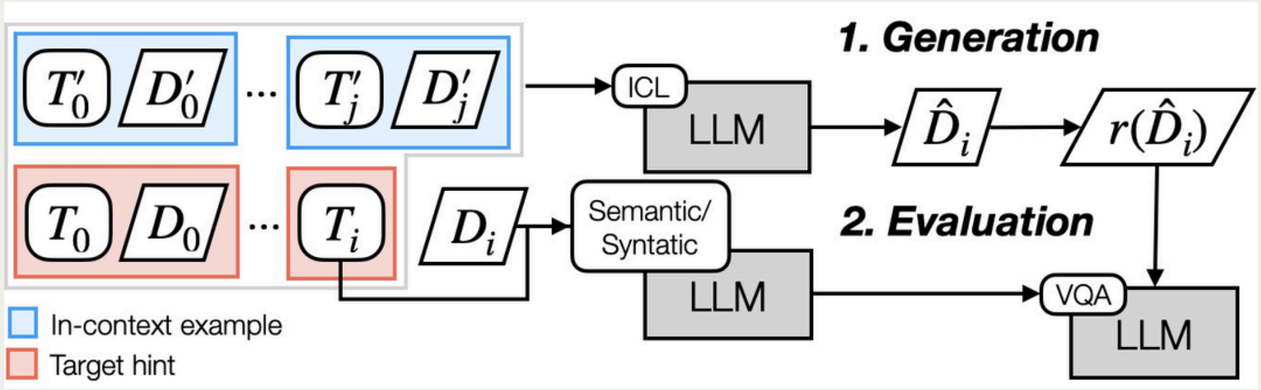


- **Problem**: It's unclear what it means for an LMM to "understand" an image. How does an AI's spatial comprehension change when it sees only pixels (PNG) versus the underlying structural code (SVG)?
- **Research Question**: How does the AI's input format affect its spatial identification ability versus its spatial reasoning ability?
- **Methodology**: I designed a quantitative experiment, testing 3 LMMs (GPT-4o, Claude) on 75 floor plans across 3 input formats. I measured accuracy on 4 distinct spatial tasks (e.g., room count, label identification, path validation).
- **Findings & Contribution**: Providing both pixels and structure (PNG+SVG) yielded the highest performance for identification tasks. However, for complex reasoning (like pathfinding), the SVG code actually confused the AI and hindered its performance, revealing a critical nuance in how AI comprehends 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

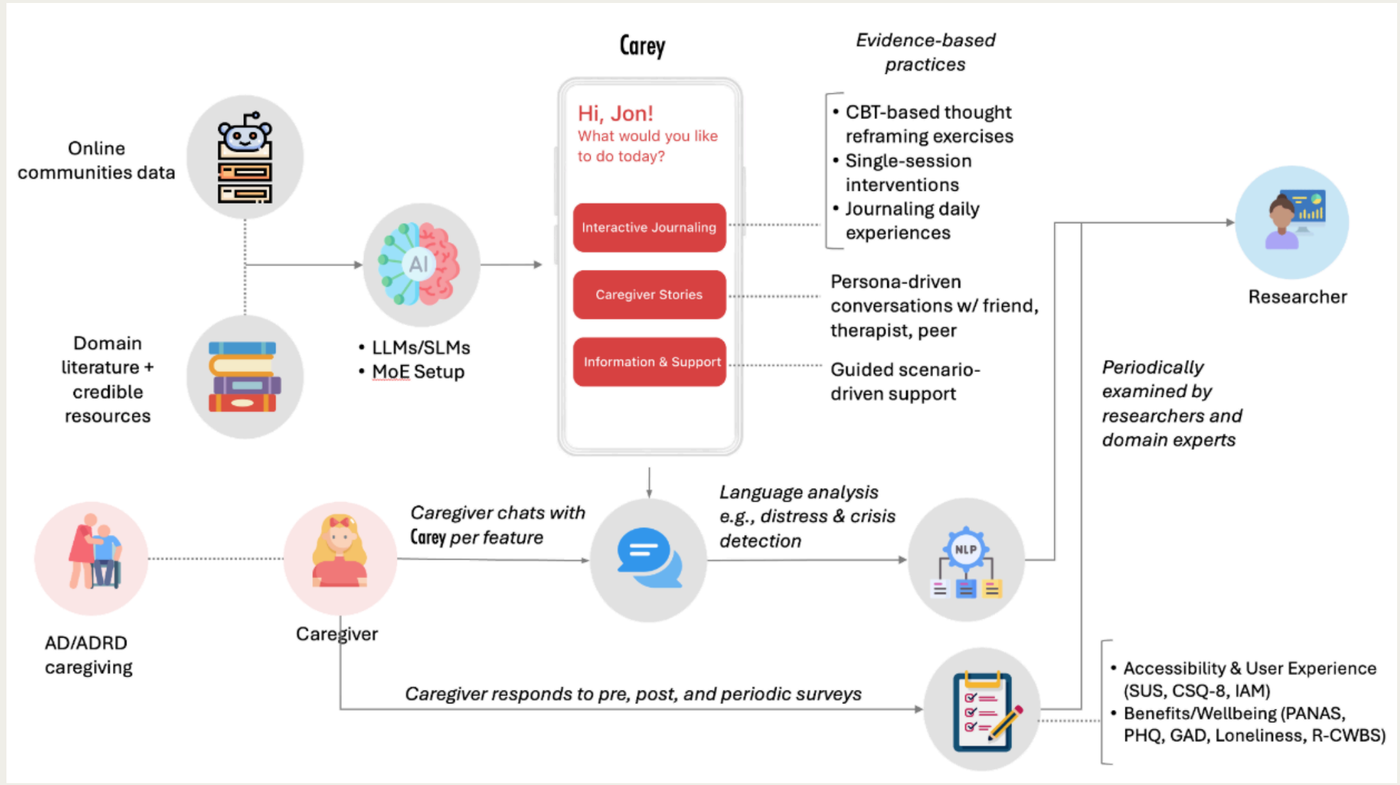


- **Problem**: It is highly time-consuming for teachers to manually create diagrams for math problems. Students struggle to understand abstract concepts from text-only hints.
- **Research Question**: Can LLMs generate mathematically accurate diagrams from text hints, and how do we evaluate quality at scale?
- **Methodology**: Developed an AI pipeline using LLMs and In-Context Learning to generate SVG code directly from text hints. We also designed a novel evaluation framework using a VQA (Visual Question Answering) model to autonomously grade the quality of the generated diagrams.
- **Findings & Contribution**: LLMs are significantly better at generating precise code (SVG) for math concepts than pixels (DALL-E). We also contributed a new framework for using AI (VQA) to automatically evaluate the quality of AI-generated visualizations, enabling scalable research.

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

Prototype Link

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



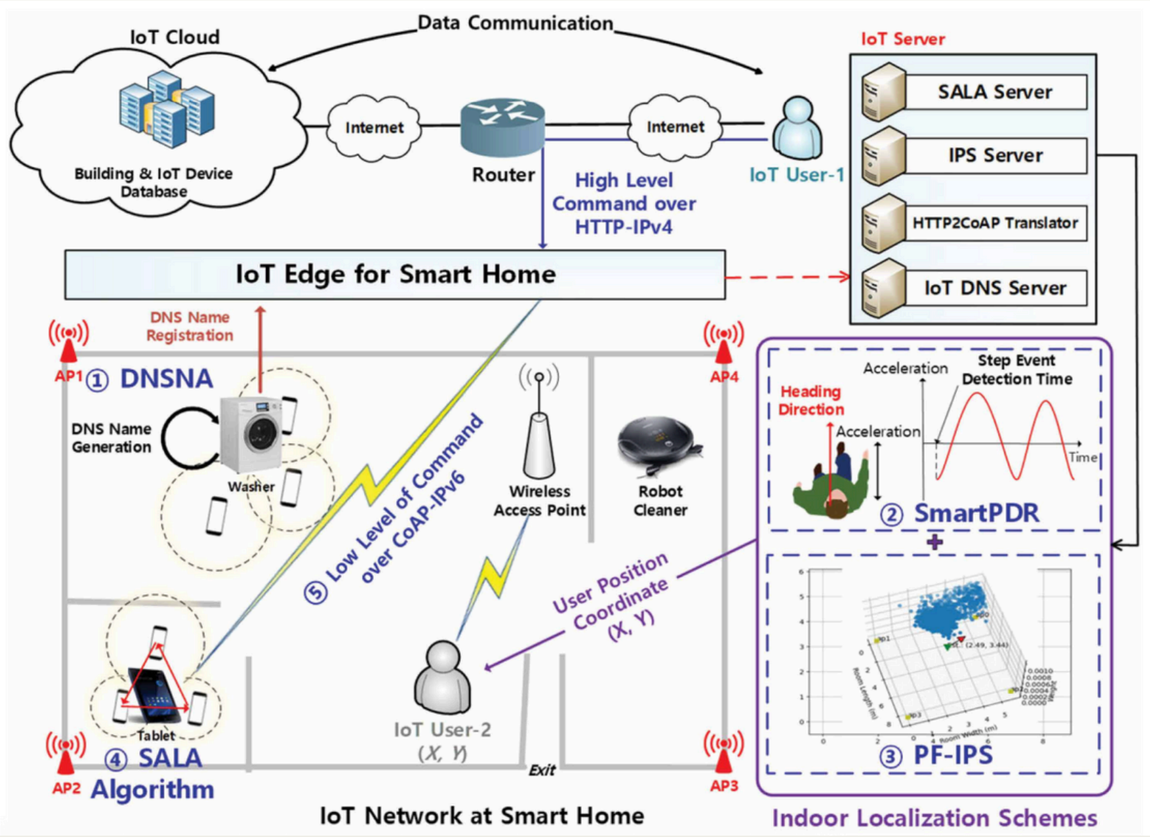
- **Problem**: Alzheimer's caregivers face extreme, multifaceted stress. They require more than a single chatbot; they need distinct tools for emotional venting, cognitive reframing (CBT), and finding trusted medical information.
- **Research Question**: How can we design a system, grounded in CBT principles, that distinguishes between a user's diverse intents and provides specialized AI support for each?
- **Methodology**: Led the design and development of "Carey," a full-stack (Flask, React, MongoDB) multi-agent AI system. I built specialized agents for "Venting," "CBT-based Reframing," and "RAG-based Info Search," routing the user to the correct agent based on their intent.

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 are just long, confusing lists of devices (e.g., "Light-A24"). Users have no idea which device is where in their physical home, making management difficult.
- **Research Question**: How can we build a system that bridges the gap between a user's digital interface and the physical location of their IoT devices to create an intuitive control experience?
- **Methodology**: Developed an IoT system architecture that uses indoor localization algorithms (SALA, PF-IPS) to pinpoint device locations. This location data is then used to auto-generate a DNS name (DNSNA) and display all devices on a visual map in a smartphone app.
- **Findings & Contribution**: We built a system that allows users to visually control their home. Instead of a list, the user just taps the kitchen light on the map. Our evaluation showed a high localization accuracy with an average error of only 1.08 meters, proving the system's feasibility.

work experience

2020 SK planet

Industry-Academia Research Intern

- Title: "AR Music Note": Gamifying the User Journey with AR
- Problem: Attendees for the Busan One Asia Festival were disengaged during the walk from public transport to the venue. This commute was a missed opportunity for brand interaction.
- Project Goal: How can we transform the physical journey to the festival into an interactive and enjoyable brand experience, driving user engagement before they even arrive at the venue?
- Methodology: I co-developed a location-based Augmented Reality (AR) rhythm game using AR Core. I designed the UI/UX (Figma) and mapped game triggers to real-world GPS coordinates on the path to the venue.
- Impact & Contribution: I led the initial project idea, planning, and full user scenario design. My contribution was turning a passive "walk" into an active, gamified "journey," demonstrating how AR can enhance real-world user engagement.

2023 Cipherome

Machine Learning Engineer

- Problem: Clinicians possess vast patient datasets (like the UK Biobank) but lack accessible tools. Existing ML platforms are designed for data scientists, not doctors, creating a high barrier to entry for medical research.
- Project Goal: How can we design a platform that makes complex ML analysis (e.g., patient clustering) and its results (e.g., ROC curves) accessible, interpretable, and actionable for clinicians?
- Methodology: This was a dual-focus role.
- (Engineer): I developed the ETL and ML pipeline (Python, Pydantic) to process UK Biobank data for conditions like COPD and CRC.
- (UX): I designed Figma wireframes for the platform's UI, focusing specifically on how to clearly visualize and present the complex ML results (ROC curves, Kaplan-Meier plots) to a non-technical medical audience.
- Impact & Contribution: My key contribution was bridging the gap between the backend ML pipeline and the frontend UI. I didn't just build the model; I designed the user experience for the model, ensuring complex data was presented accessibly to doctors.

2024 SNUH Seoul National University Bundang Hospital Biomedical Research Institute

NLP Researcher

- Problem: Clinicians manually read massive, unstructured Electronic Health Records (EHR) to determine a patient's lung cancer TNM stage. This process is slow, labor-intensive, and prone to human error.
- Project Goal: Can we automatically and accurately predict a patient's TNM stage directly from their raw, unstructured EHR text, thereby accelerating the diagnostic workflow for doctors?
- Methodology (Eng): I developed an NLP pipeline to process a large-scale EHR dataset. I fine-tuned LLMs on this specialized medical text. A key challenge was a "resource-restricted setting," so I applied tailored prompt engineering techniques to optimize model performance.
- Impact & Contribution: My work translates messy, unstructured clinical notes (a poor UX) into a clean, predictive, and actionable insight (a good UX). This system serves as a decision-support tool, helping clinicians make faster, more informed diagnoses.

why hire me

I Build to Think.

I rapidly build interactive, full-stack prototypes to test complex AI and accessibility interactions that static designs can't capture. This allows me to ask better questions and get high-fidelity data from real users.

I Design Systems, Not Just Screens.

As a UX Engineer, my focus is the entire system. My work lives at the intersection of data flow, model behavior, API design, and the on-screen UI. I design for how these components combine to create an intuitive, robust, and cohesive user experience.

I Validate with Rigorous Research.

My engineering is guided by research. I design and run empirical user studies (both qualitative and quantitative) on the systems I build. This allows me to rigorously validate my ideas and prove that my technical solutions solve real, human problems.

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

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References

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