

# 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 Iedge-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)

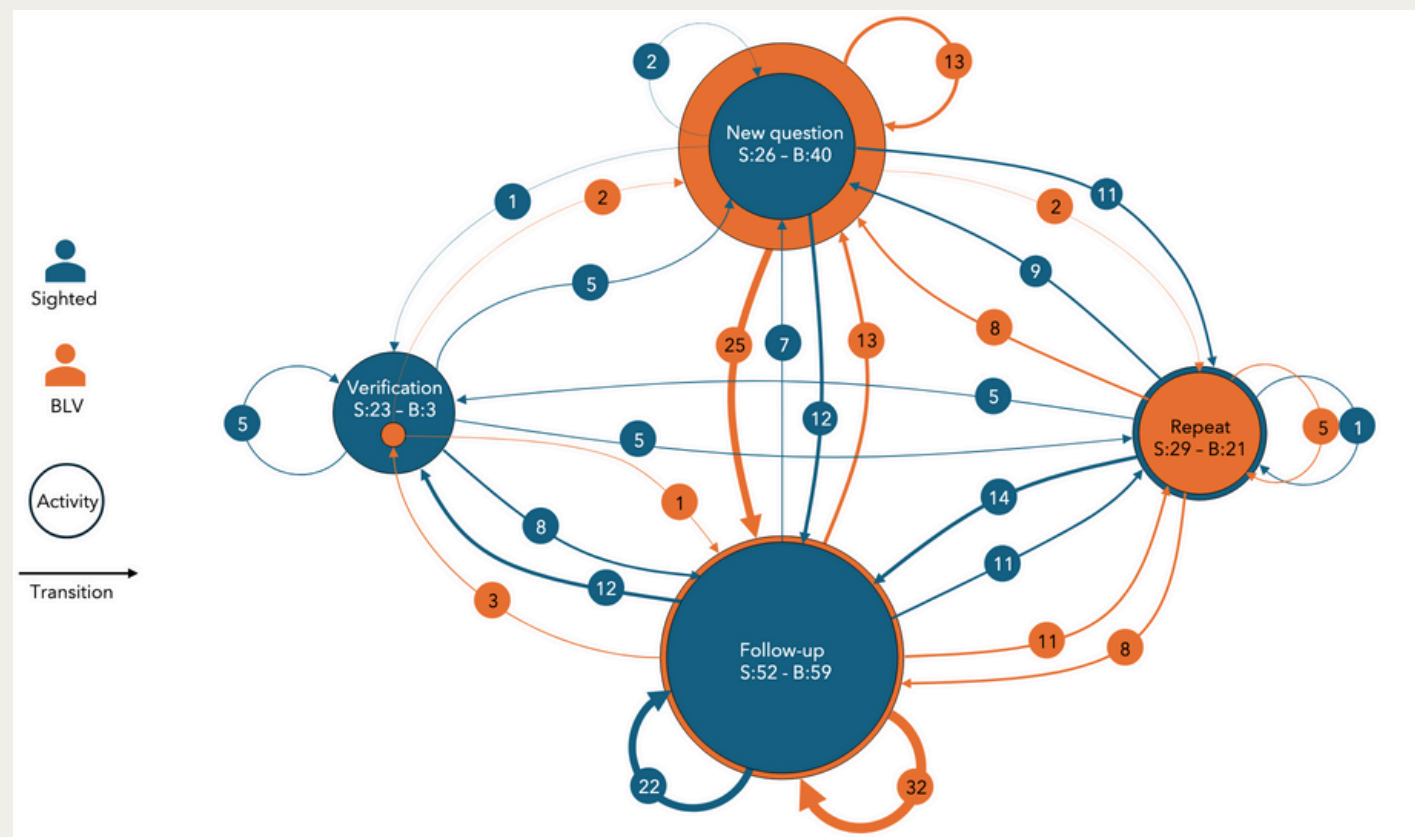
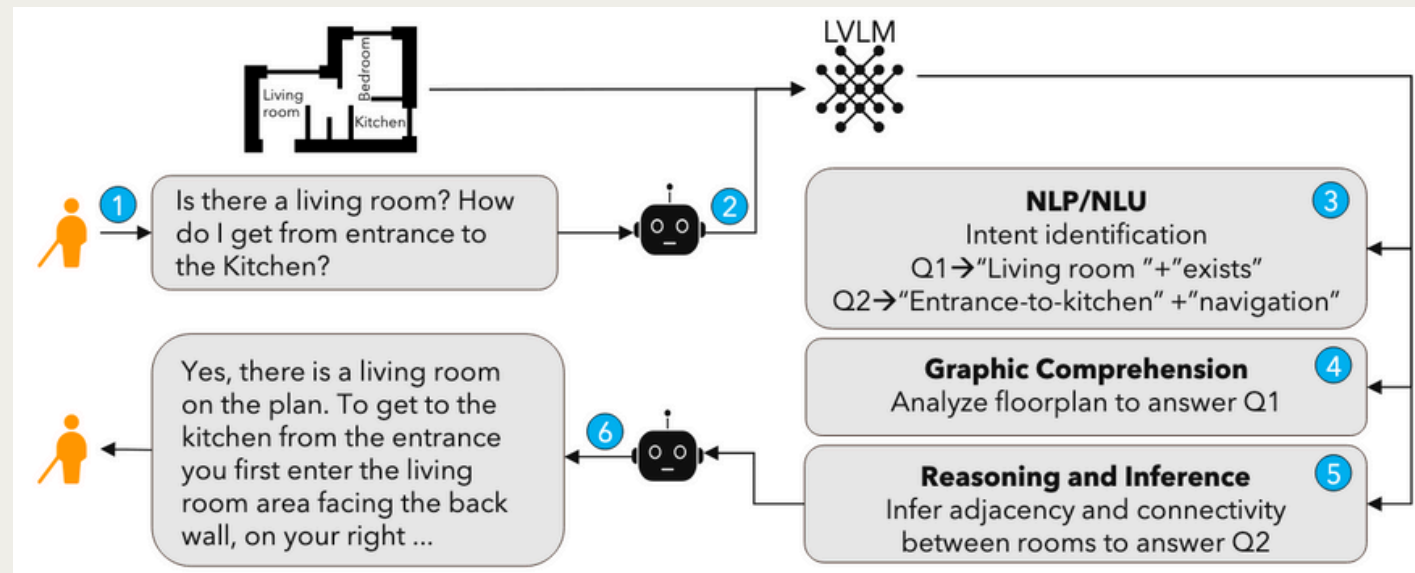


University of  
Massachusetts  
Amherst

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)

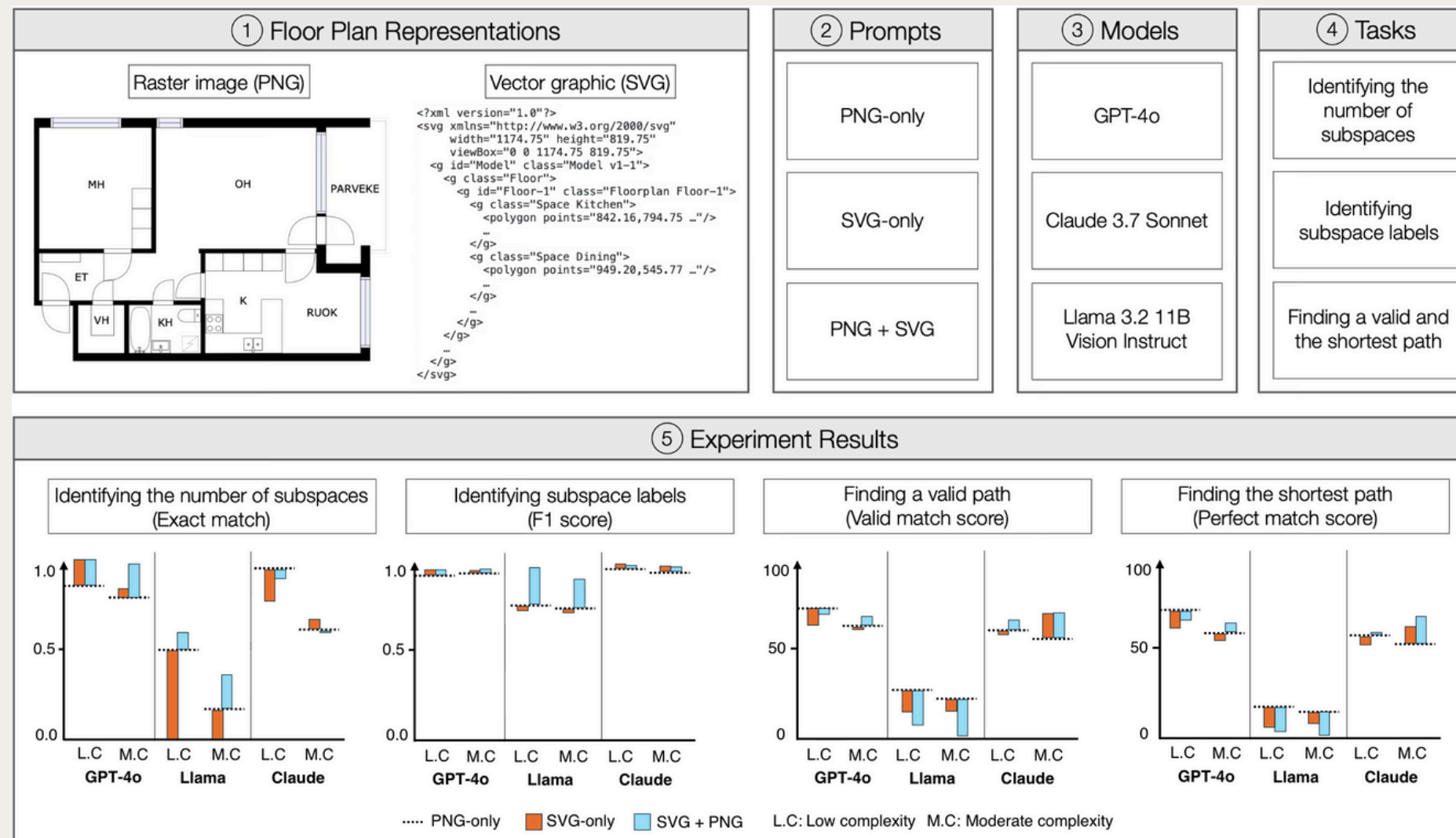


University of  
Massachusetts  
Amherst



[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)

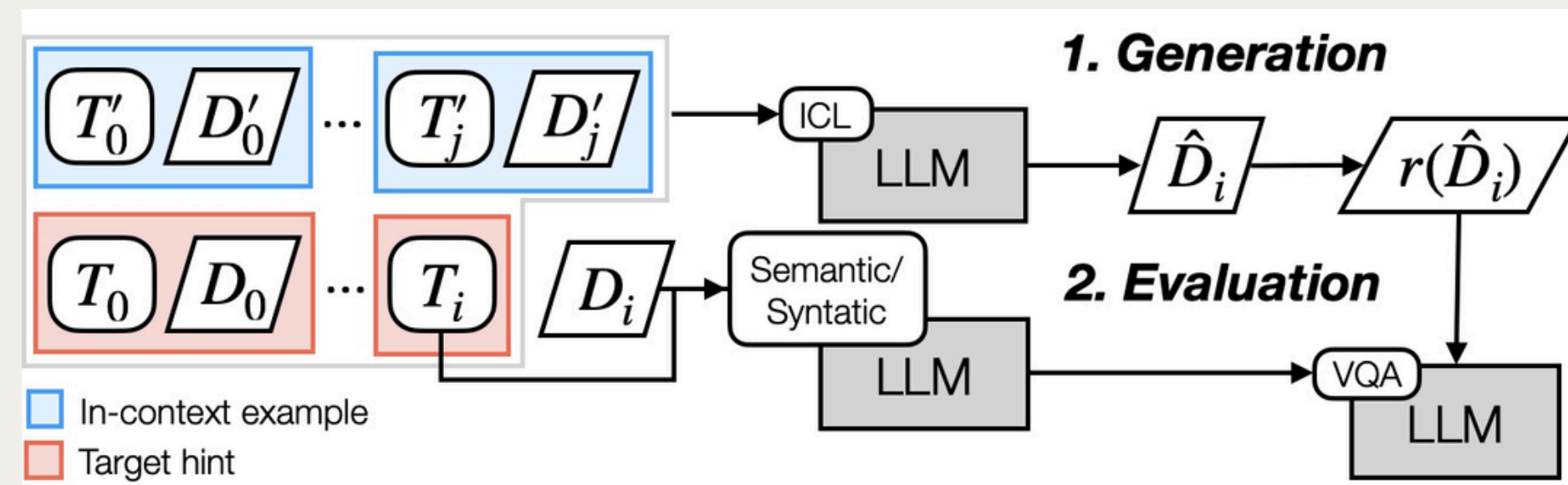


University of  
Massachusetts  
Amherst



[Full paper link](#)

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



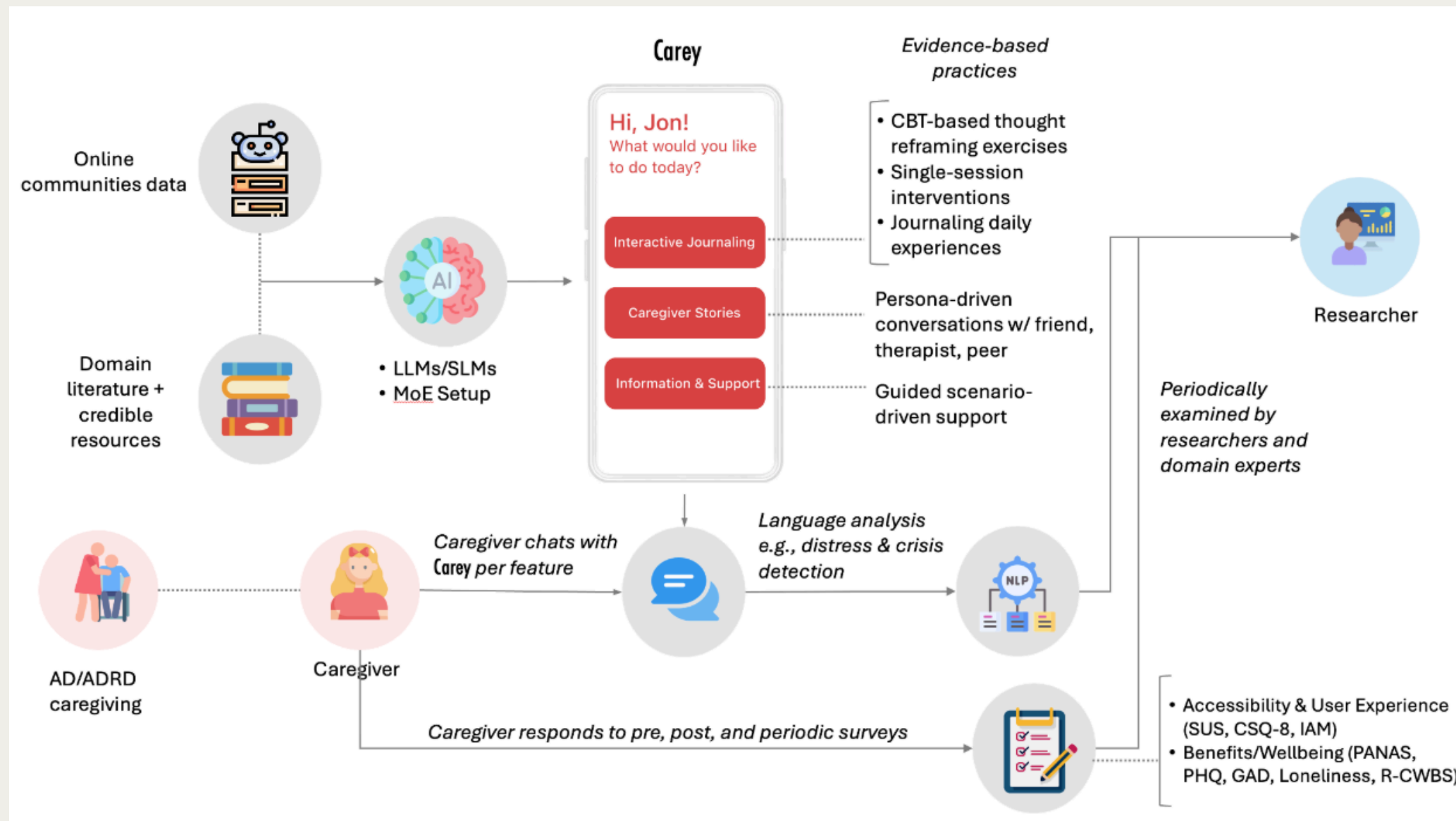
- **Problem:** Manually creating math diagrams is time-consuming for teachers and students struggle to understand abstract concepts from text-only hints.
- **Research Question:** Can LLMs generate mathematically accurate diagrams from text hints, and how do we evaluate quality at scale?
- **Methodology:** 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



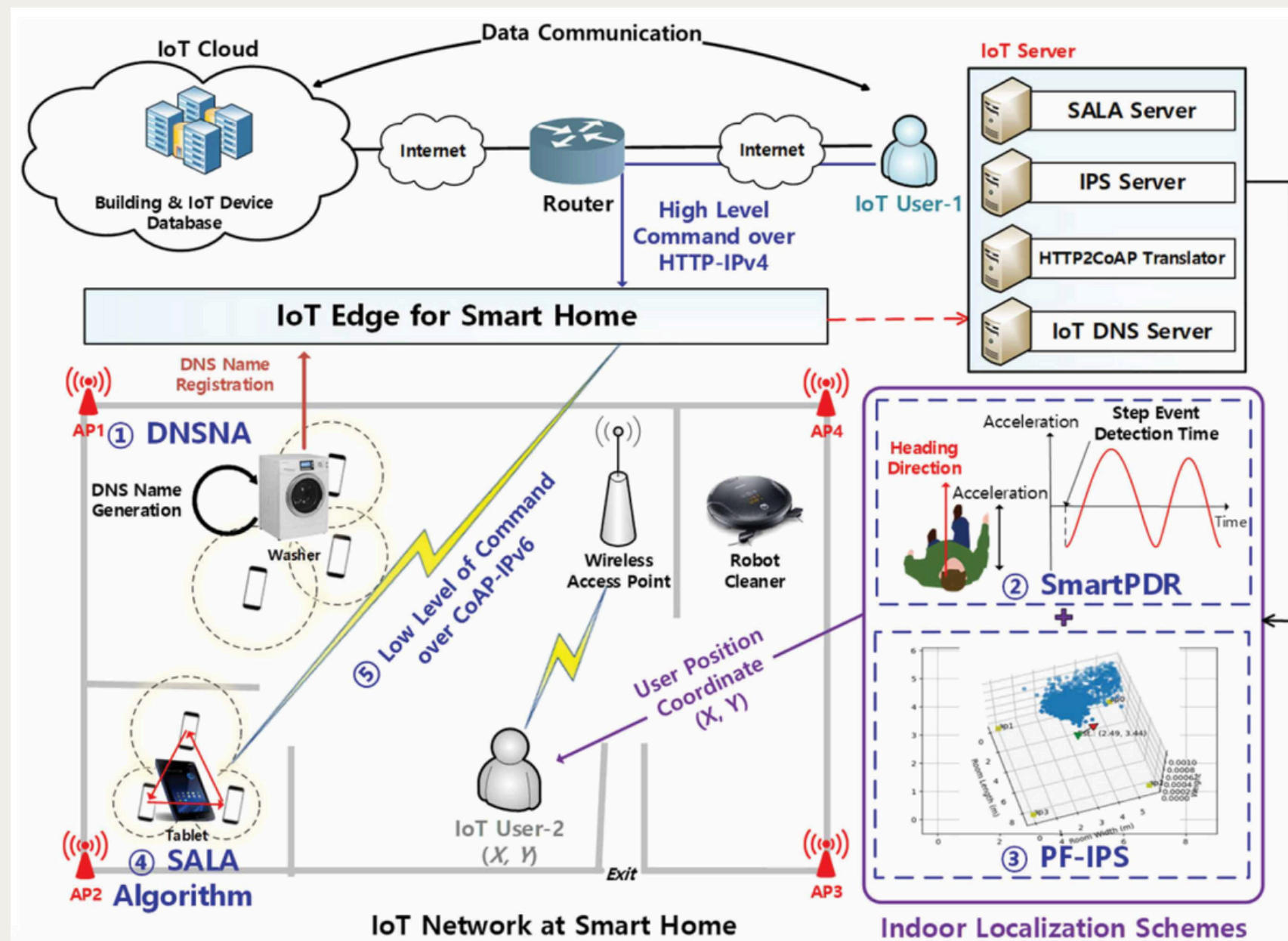
- **Problem:** Alzheimer's caregivers face chronic emotional and cognitive strain, requiring adaptive, multi-dimensional support.
- **Research Question:** How can we design a multi-agent AI system that recognizes caregivers' distinct emotional, cognitive, and informational needs and provides tailored, 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 Edge-Cloud: An Internet-of-Things Edge-Empowered Cloud System for Device management in Smart Spaces (IEEE Network magazine)

[Full paper link](#)

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



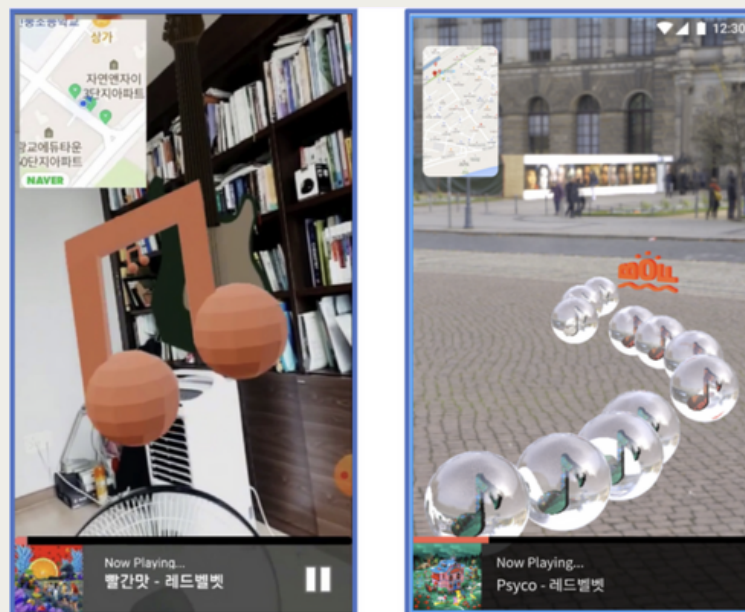
- **Problem:** Smart home apps list devices with cryptic names (e.g., Light-A24), making it hard for users to know where each device actually is.
- **Research Question:** How can we design a spatially-aware IoT interface that links digital controls to the physical locations of devices?
- **Methodology:** 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

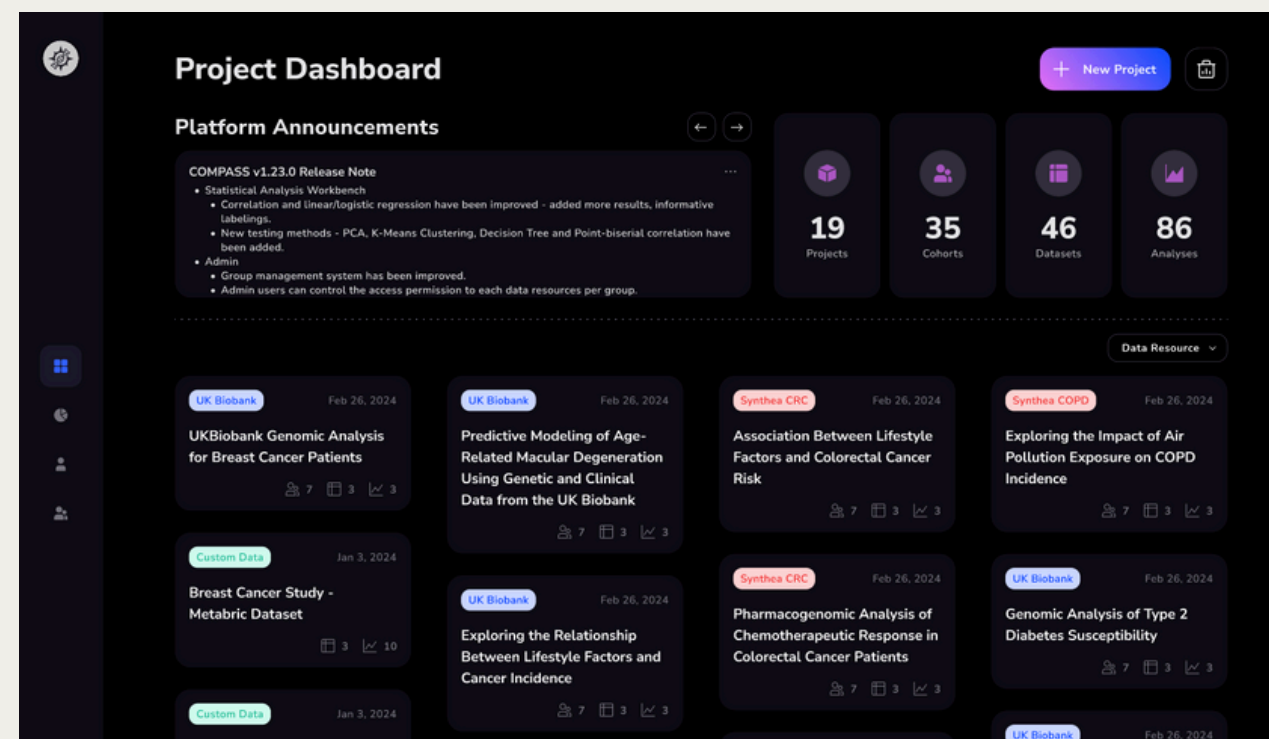
- Designed "AR Music Note," a location-based AR rhythm game that gamified the walk to the Busan One Asia Festival.
- Built using ARCore; designed UI/UX in Figma and mapped game triggers to GPS coordinates.
- Transformed a passive commute into an interactive brand journey, enhancing real-world user engagement.



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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## References

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