# ALYSSA HWANG

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*Human-AI Systems ◇ User-driven research and product direction*

## SUMMARY

PhD-trained researcher working on human–AI systems, with a particular interest in AI interfaces that help people understand complex information. I am drawn to problems where existing tools do not align with how people reason, such as reading dense technical documents or interpreting complex figures. Much of my work involves designing and exploring new interface patterns that use emerging AI capabilities to support familiar affordances like navigation and explanation. I combine prototyping with qualitative and empirical studies to understand how people make sense of complex material and help teams avoid building systems that break down in real use.

## INDUSTRY EXPERIENCE

**Amazon Web Services**, *Applied Scientist Intern* May–Sept 2022

- Developed NewsQs, a dataset of question–answer pairs over clusters of news articles, to support research on multi-source, query-based summarization.
- Fine-tuned and evaluated a T5-based question generation model with human-calibrated filtering to ensure relevance and usability of generated questions.

**Google**, *Software Engineering Intern* May–Aug 2021

- Designed clustering and ranking methods to surface representative user-submitted review images in Google Shopping, focusing on relevance and coverage rather than raw volume.

**Google** Software Engineering Intern June–Aug 2020

- Implemented hierarchical RNN models with BERT embeddings to support dialogue act prediction, contributing to internal exploration of conversational structure and labeling schemes.

**Google** Software Engineering Intern May–Aug 2019

- Integrated multiple backend services and APIs to surface relevant images in Google Search event cards, supporting a user-facing feature at large scale.

## SELECTED HUMAN–AI SYSTEMS WORK

**Fine-grained Figure-Text Integration at Document Scale**, *Penn HCI* June 2024–Oct 2025

- Developed a framework for fine-grained integration of text and figures in research papers, grounded in empirical observations of how readers struggle to locate, interpret, and connect visual details scattered across a document.
- Built an end-to-end AI pipeline and interactive reading interface that link textual references to specific figure regions using vision-language models and image segmentation, supporting localized figure points and guided figure scans for incremental navigation of complex visuals.
- Conducted think-aloud studies and a controlled between-subjects evaluation comparing baseline and augmented interfaces, showing that fine-grained support improved quiz performance while also revealing tradeoffs around fragmentation and reader control.

**Ivie: Lightweight Anchored Explanations of Just-Generated Code**, *Penn HCI* Sept 2023–June 2024

- Contributed to the design of an interface for surfacing lightweight, anchored explanations of generated code at the moment they are needed.
- Conducted a lab study comparing Ivie to a baseline tool, showing improved code understanding and strong user perceptions of usefulness with low distraction.
- Published at CHI 2024.

**Grounded Intuition of GPT-Vision's Abilities with Scientific Images** Aug–Oct 2023
*Penn HCI*, *Penn NLP*

- Developed a structured qualitative approach to characterize how GPT-Vision handles complex scientific imagery, with attention to failure modes and misleading outputs.
- Analyzed long-form model responses to identify recurring strengths, limitations, and sensitivities related to prompting, spatial relationships, and embedded text.
- Presented findings to Google PAIR; work covered by TechCrunch and 160+ news outlets.

**Rewriting the Script: Text Instructions for Voice Interaction**, *Penn HCI*, *Penn NLP* Jan–Dec 2022

- Investigated how conventional text-based procedural instructions (like written recipes) fail when presented verbatim through voice assistants and identified core challenges users face when following them in real environments.
- Proposed a set of voice-appropriate transformation capabilities (e.g., summarizing, elaborating, and reordering content) aimed at making procedural instructions more actionable in eyes-free, hands-busy interactions.
- Conducted a qualitative study where participants followed recipes with current voice assistant guidance, documenting breakdowns and emergent needs that inform design directions for future voice interfaces supporting complex task guidance.
- Published at DIS 2023.

## SELECTED HONORS

**OpenAI** DevDay Invited Attendee — Nov 2023
**Penn Engineering** Outstanding Service Award — May 2023
**Amazon Alexa Taskbot Competition** Finalist Team — Feb 2022
**National Science Foundation** Graduate Research Fellowship — April 2020

## EDUCATION

**University of Pennsylvania** — Philadelphia, PA
*PhD* in Computer and Information Science — Dec 2025
*MS* in Computer and Information Science — Dec 2023
*Advisors*: Boon Thau Loo, Andrew Head
*Thesis*: User Interfaces for Fine-grained Integration of Information

**Columbia University** — New York, NY
*BS* in Computer Science — May 2020
*Advisor*: Kathleen McKeown
*Thesis*: Towards Augmenting Lexical Resources for Slang and African American English