

KAI-HUI LIANG

New York City | kaihui.liang@columbia.edu | www.linkedin.com/in/kaihuiliang/ | (530)760-5333

RESEARCH INTERESTS

- Human-Computer Interaction (HCI)
- Conversational Interfaces and Dialogue Systems
- Human-Centered AI
- Lifestyle Behavior Change Support Systems
- Digital Interventions for Mental Health and Well-being
- Interactive and Intelligent Educational Systems

EDUCATION

Columbia University , New York, NY	Jan 2021 – Jan 2025
Ph.D. Candidate in Computer Science. Advisor: Zhou Yu	
University of California, Davis , Davis, CA	Sep 2018 – Dec 2020
M.S. & PhD student in Computer Science	
National Taiwan University , Taipei, Taiwan	Sep 2004 – Jun 2010
M.S. & B.S. in Chemical Engineering	

PUBLICATION

* = Co-first authorship (equal contribution)

Journal Articles

- J.3 Oh, Y. J., **Liang, K. H.**, Kim, D. D., Zhang, X., Yu, Z., Fukuoka, Y., & Zhang, J. (2025). Enhancing physical activity through a relational artificial intelligence chatbot: A feasibility and usability study. **Digital Health**, 11, 20552076251324445.
- J.2 **Liang, K. H.**, Shi, W., Oh, Y. J., Wang, H. C., Zhang, J., & Yu, Z. (2024). Dialoging Resonance in Human-Chatbot Conversation: How Users Perceive and Reciprocate Recommendation Chatbot's Self-Disclosure Strategy. Proceedings of the ACM on Human-Computer Interaction (**PACM HCI**), 8(CSCW1). (Presented at **CSCW 2024**)
- J.1 Cohn, M., **Liang, K. H.**, Sarian, M., Zellou, G., & Yu, Z. (2021). Speech rate adjustments in conversations with an Amazon Alexa socialbot. **Frontiers in Communication**, 6, 671429. [Cited by 34]

Peer-reviewed Conference Papers

- C.4 **Liang, K. H.**, Davidson, S., Yuan, X., Panditharatne, S., Chen, C. Y., Shea, R., ... & Fryer, L. (2023, July). ChatBack: Investigating methods of providing grammatical error feedback in a GUI-based language learning chatbot. In Proceedings of the 18th workshop on innovative use of NLP for building educational applications. (**BEA 2023**) [Cited by 24]
- C.3 Zhu, Q., Chau, A., Cohn, M., **Liang, K. H.**, Wang, H. C., Zellou, G., & Yu, Z. (2022, July). Effects of emotional expressiveness on voice chatbot interactions. In Proceedings of the 4th conference on conversational user interfaces (**CUI 2022**) .
- C.2 Liang, W.*, **Liang K. H.***, Yu, Z. (2021, August). HERALD: An Annotation Efficient Method to Train User Engagement Predictors in Dialogs. Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers) (**ACL 2021**)

C.1 **Liang, K. H.**, Lange, P., Oh, Y. J., Zhang, J., Fukuoka, Y., Yu, Z. (2021, July). Evaluation of In-Person Counseling Strategies To Develop Physical Activity Chatbot for Women. In Proceedings of the 22th Annual Meeting of the Special Interest Group on Discourse and Dialogue (**SIGDIAL 2021**).

Technical Report

T.1 **Liang, K. H.**, Chau, A., Li, Y., Lu, X., Yu, D., Zhou, M., Jain, I., Davidson, S., Arnold, J., Nguyen, M., Yu, Z. (2020). Gunrock 2.0: A User Adaptive Social Conversational System. **Alexa Prize SocialBot Grand Challenge 3** Proceedings. [Cited by 35]

AWARD

Finalist, Amazon Alexa Prize Socialbot Grand Challenge 3

Jun 2020

- One of the 5 finalist teams over 375 applications from 15 countries

LEADERSHIP

Team Lead - UC Davis, Team GunRock | Amazon Alexa Prize Socialbot Challenge 3

Jun 2019 - Jul 2020

Davis, CA, USA

Led the full lifecycle of a real-world AI chatbot system—from vision and team formation to technical execution and user evaluation—as part of Amazon’s global Alexa Prize competition. This role required cross-functional leadership across research, engineering, project management, and stakeholder coordination.

- **Team leadership:** Directed a 13-member interdisciplinary team to design and deploy a real-time, open-domain, voice-based social chatbot on Amazon Alexa, engaging 1,000+ users daily.
- **Team Building & Mentorship:** Recruited, onboarded, and mentored members across NLP, linguistics, engineering, communications, and marketing; fostered collaboration and knowledge sharing.
- **Project Direction, Management & Coordination:** Defined core scope and delivery milestones; prioritized features, guided system design, managed sprints and timelines, and coordinated communication with faculty and Amazon Alexa Prize organizers.
- **Technical & Engineering Leadership:** Improved system architecture, code modularity, and response latency in a large-scale dialogue system; led documentation, code reviews, and DevOps workflows (CI/CD, deployment, automated/manual testing) to ensure development efficiency and reliability.
- **User-Centered Evaluation:** Conducted in-person user studies and chat log analysis to uncover issues, extract behavioral insights, and inform iterative design improvements.

RESEARCH EXPERIENCE

Research Associate - Computational Behavioral Science Lab

Aug 2025 – Present

Columbia Business School, Columbia University, New York, NY

Supervisor: Prof. Sandra Matz

Conduct research on negotiation and conversational dynamics, examining how personality influences observed in human-to-human negotiation are reflected in AI-to-AI negotiation.

Graduate Researcher - Natural Language Processing Lab

Jan 2019 – Jan 2025

UC Davis, Davis, CA (2019–2020) → Columbia University, New York, NY (2021–2025)

Advisor: Prof. Zhou Yu

Conducted interdisciplinary, human-centered research on intelligent conversational systems to support behavior change, language learning, and user engagement. Investigated design and interaction strategies to enhance behavioral and learning outcomes, as well as user experience, across text- and voice-based interfaces; analyzed user behavior during interaction. Projects integrated methods from NLP, HCI, communication, education, and behavioral science, with applications in digital health, learning technologies, and socially assistive systems.

- **Healthy Lifestyle Behavior Change:** Developed a counseling intervention chatbot using relational dialogue strategies [**J.3**]; evaluated in-person counseling practices to inform conversational design [**C.1**].
- **Educational chatbot:** Designed an language learning chatbot to study conversational corrective feedback strategies, including the effects of graphical user interfaces and support for learner self-correction [**C.4**]; enhanced user engagement and retention through exploratory interviews and formative usability testing of a pilot system; also developed a multimodal dialogue system to support language learning for young children.
- **Human–Chatbot Interaction:** Studied the effects of chatbot self-disclosure [**J.2**]; identified conversational heuristics associated with user disengagement [**C.2**].
- **Voice-Based Human–Chatbot Interaction:** Investigated the impact of speech rate on user interaction behavior [**J.1**]; examined how emotional expressiveness via prosody influences user experience [**C.3**].

Applied Scientist II Intern - Amazon Alexa AI

May 2022 – Aug 2022

Amazon, Bellevue, WA, USA

Developed methods to improve knowledge identification in document-grounded dialogue systems by distilling training data and augmenting input with contextual information to enhance retrieval-augmented performance.

Graduate Technical Intern, Intel Human-AI System Research Lab

Jun 2021 – Aug 2021

Intel Corp, Santa Clara, CA, USA

Designed strategies to detect and re-engage children from off-topic behavior in a multimodal, dialog-based educational system.

Senior R&D Engineer

Oct 2011 – Mar 2014

AU Optronics Corp. (AUO), Hsinchu Science Park, Taiwan

Conducted applied research and cross-departmental coordination to enhance display technologies and implement scalable manufacturing processes in a high-volume production setting.

- **Conducted experimental research** to evaluate and integrate novel LCD and touch screen manufacturing techniques into existing product lines, improving production yield, cost-efficiency, and display performance.

- **Facilitated complex cross-departmental collaboration** with engineering teams and factory personnel to align technical goals, resolve conflicting operational needs, and negotiate production line access under strict scheduling constraints.
- **Assessed third-party equipment and materials** through vendor engagement, experimental evaluation, and performance testing. **Communicated findings** through technical reports and presentations to support strategic decision-making and process optimization.

TEACHING EXPERIENCE

Teaching Assistant - COMS 4705 Natural Language Processing, Columbia University Fall 2023

Teaching Assistant - COMS 4156 Advanced Software Engineering, Columbia University Spring 2023

TECHNICAL SKILLS

Programming Languages:

Java, Python, C, Shell Scripting

Frontend Development (Web & Mobile):

HTML, CSS, JavaScript, D3.js, Native Android Development

Backend & Cloud Technologies:

RESTful APIs, Ruby on Rails, AWS (Lambda, EC2, CloudWatch), Alexa Skills Kit

Databases:

MongoDB, DynamoDB, Redis, SQLite, Firebase

Natural Language Processing, Machine Learning & Data Analysis:

PyTorch, BERT, Scikit-learn, NumPy, Pandas, R

Software Development, Engineering & Tools:

- Methodologies: Agile Software Development, Test-Driven Development (TDD)
- Testing: Unit Testing, Integration Testing, Regression Testing, Usability Testing, Automated Testing

Project management & Tools:

- Methodologies: Agile, Scrum, Kanban
- Tools: Trello, Asana, Notion