RESEARCH PROFILE	Human-AI Interaction researcher with expertise in designing, deve ing ML- and LLM-infused interactive systems that enhance human ciency and creativity. Specializes in combining cognitive theories AI to improve problem-solving and ideation across domains, from so creative design. Proven track record of impactful collaborations with academic institutions, resulting in award-winning research and rea that amplify human capabilities in knowledge synthesis and complex	loping, and deploy- n+AI cognitive effi- s with cutting-edge cientific discovery to industry leaders and l-world applications & problem-solving.
	Broad research interests include Human-AI Interaction, Human-Co Creativity Support Systems, Analogical Reasoning, and Social Com	omputer Interaction, puting.
EDUCATION	Carnegie Mellon University, Pittsburgh, PA Ph.D. in Human-Computer Interaction THESIS: Accelerating Innovation through AI-Powered Conceptual Abstr Design COMMITTEE: Dr. Aniket Kittur (Chair), Dr. Sherry Tongshuang Martelaro, Dr. Michael Terry	08/2018 – 08/2024 action and Interaction g Wu, Dr. Nikolas
	<b>University of California, San Diego</b> , La Jolla, CA Master of Science in Computer Science Advisors: Dr. Steven Dow and Dr. Philip Guo	06/2017
	<b>Seoul National University</b> , Seoul, South Korea Bachelor of Science in Computer Science and Engineering	02/2015
AWARDS AND HONORS	Best Paper Honorable Mention Award, ACM CHI Best Paper Award, ACM CHI Google Cloud Research Innovators National Academic Excellence Scholarship (Science and Engine	May 2025 May 2024 March 2021 ering) Spring 2009
EMPLOYMENT	Allen Institute for AI, Remote <i>Research Scientist Intern</i> Rese Hosts: Dr. Jonathan Bragg, Dr. Joseph Chee Chang Developed and evaluated a literature discovery system that leverages a search threads to help users discover new papers and authors, as well research landscape. This system was shown to be significantly more ventional paper-recommender systems in a controlled laboratory st of ComLittee is available at this link <sup>1</sup> .	05/2022 – 08/2022 earch Output: [C.8] authors and their re- as make sense of the e effective than con- udy. A demo video
	Allen Institute for AI, Remote <i>Research Scientist Intern</i> Research Hosts: Dr. Jonathan Bragg, Dr. Doug Downey, Dr. Daniel Weld Contributed to the development and field study of personalized messa engagement with alert emails that recommend new research papers method increased click-through rates by 28% and boosted overall by 13%, with a notable with a 30% increase in email open rates after exposure. This study involved 7,000+ participants over a 2.5-month p were deployed on the Semantic Scholar search engine <sup>2</sup> .	05/2021 – 08/2021 arch Output: [C.10] ages to improve user . Our most effective future engagement r the first two-week period. The methods

Email: ein3108@gmail.com · Website: www.hyeonsukang.com · Updated: April 1, 2025

<sup>&</sup>lt;sup>1</sup>https://rb.gy/bm2ydx

<sup>&</sup>lt;sup>2</sup>https://www.semanticscholar.org/. As of 2023, Semantic Scholar has millions of monthly users.

	Massachusetts Institute of Technology, Cambridge, MA10/2017 – 7/2018Research EngineerResearch Output: [W.7]Contributed to engineering a programming language for StarLogo Nova³ that allowsthe creation of higher-level programming blocks, selectively abstracting low-level implementation details. The language was developed in research partnerships with K-12teachers in New York and Tennessee across subjects such as astronomy, physics, andecology to transform their lessons into an engaging, programmable simulation environment that also integrates programming education.
	<b>University of California, San Diego</b> , La Jolla, CA 06/2017 – 09/2017 <i>Staff Research Associate under Dr. Steven Dow at ProtoLab.</i> Research Output: [C.13] Developed an interactive example gallery search and feedback provision system designed to help users give better design feedback. I evaluated the system in two studies involving crowd workers, demonstrating how they used examples and the system effectively to provide significantly higher-quality feedback.
	Tableau Software, Seattle, WA06/2016 - 09/2016Software Engineer InternReceived a full-time return offer.Developed a prototype tooltip visualization feature and its programming language for Tableau Desktop. Helped to analyze ~660,000 Tableau Public workbooks' source code and semantically grouped them into representative clusters to justify design choices and analyze backward compatibility of the feature. Here is a blog post from Tableau Soft- ware <sup>4</sup> announcing the feature I contributed to, called Vis in Tooltip.
TECHNICAL SKILLS	Front-end: Javascript, React.js <sup>5</sup> Back-end: Python, Flask, Postgres, AWS, GCP, Docker AI: LLMs, Fine-tuning, Replicate Analysis: R, Tableau, Python, Jupyter Notebook, Latex, Discord
SELECTED PROJECTS	<b>Synergi</b> (with AI2). In Synergi I develop an AI-powered reading interface with an in- telligent text highlighter that helps people understand prior knolwedge by organizing information based on concepts and their relations while they're reading with a simple highlighting gesture. Synergi backend pipeline <b>automatically extracts</b> references and metadata information based on user-highlighted text, <b>searches related papers in the ci- tation graph and finds relevant passages within them</b> , and <b>generates a hierarchical summary overview</b> of the searched papers' content with <b>an iterative algorithm for clustering</b> and <b>recursively generating summaries at each hierarchy node</b> . A demo video of Synergi is available at this link <sup>6</sup> .
	Analogy Search Engine (with <). I developed an interactive analogy search engine for scientists to find cross-domain analogies. I used the purpose ("what problem does it solve?") and mechanism ("how does it solve the problem?") schema to structure unstructured text ( <i>i.e.</i> , paper abstracts) and search for papers that have similar purposes to a query purpose but diverse mechanisms. This was enabled by fine-tuning a sequence-to-sequence model on an annotation dataset that contained over 2,000 paper abstracts' purpose and mechanism tokens, then by scaling the model inference to a 2M+ paper abstract corpus and building a real-time search index on top. In an evaluation, this approach increased the rate of creative discovery based on analogical scientific insights (diverse mechanisms from other fields) over a conventional search paradigm.

<sup>&</sup>lt;sup>3</sup>https://www.slnova.org/ <sup>4</sup>https://shorturl.at/lp0Qm <sup>5</sup>I have 6 years of front-end development experience from building various web-based systems during the Ph.D., .8 years while working on StarLogo Nova at MIT as a research engineer, and 1.5 years during the Master's.

<sup>&</sup>lt;sup>6</sup>https://rb.gy/nx4n37

**BioSpark** (with weights). In BioSpark I developed an LLM-based, end-to-end system for generating analogical bio-inspirations from diverse species at scale, and interaction features for the front-end that help designers engage with inspirations more deeply to encourage design transfer. BioSpark iteratively prompts LLMs using structured knowledge of biology (*i.e.*, the Tree-of-life taxonomy) by starting from a small set of high-quality seed inspirations available online, and continuously constructing the taxonomy structure to identify sparse branches on it that represent good opportunities for further diverse generation. BioSpark front-end also assists designers in applying these ideas to specific domains, by clustering similar mechanisms along their 'active ingredients' to help users abstract schemas, and by providing 'sparks' that map the inspiration to the domain, highlighting trade-offs, and offering a chat interface for contextualizing the inspiration. A demo video of BioSpark can be found at this link<sup>7</sup>.

**PUBLICATIONS** Top-tier venues in human-computer interaction research include ACM CHI, CSCW, UIST, IMWUT, and TOCHI.

Refereed Conference Proceedings and Journal Papers

- [C.1] BioSpark: Beyond Analogical Inspiration to LLM-augmented Transfer. Kang, Hyeonsu. B., Lin, David Chuan-En, Chen, Yan-Ying, Hong, Matthew K., Martelaro, Nikolas, and Kittur, Aniket.
   <sup>8</sup> Best Paper Honorable Mention Award. ACM CHI. 2025.
- [C.2] Inkspire: Supporting Design Exploration with Generative AI through Analogical Sketching. Lin, David Chuan-En, Kang, Hyeonsu. B., Martelaro, Nikolas, Kittur, Aniket, Chen, Yan-Ying, and Hong, Matthew K. ACM CHI. 2025.
- [C.3] The Semantic Reader Project: Augmenting Scholarly Documents through AI-Powered Interactive Reading Interfaces. Lo, Kyle, Chang, Joseph C, and Head, Andrew (et al. including Hyeonsu Kang). Communications of the ACM. 2024.
- [C.4] Mitigating Barriers to Public Social Interaction with Meronymous Communication. Soliman, Nouran, Kang, Hyeonsu. B., Latzke, Matt, Bragg, Jonathan, Chang, Joseph Chee, Zhang, Amy X., and Karger, David R.
   T Best Paper Award. ACM CHI. 2024.
- [C.5] PaperWeaver: Enriching Topical Paper Alerts by Contextualizing Recommended Papers with User-collected Papers. Lee, Yoonjoo, Kang, Hyeonsu. B., Latzke, Matt, Kim, Juho, Bragg, Jonathan, Chang, Joseph Chee, and Siangliulue, Pao. ACM CHI. 2024.
- [C.6] Imitation of Life: A Search Engine for Biologically Inspired Design. Emuna, Hen, Borenstein, Nadav, Qian, Xin, Kang, Hyeonsu. B., Chan, Joel, Kittur, Aniket, and Shahaf, Dafna. AAAI. 2024.
- [C.7] Synergi: A Mixed-Initiative System for Scholarly Synthesis and Sensemaking. Kang, Hyeonsu. B., Wu, Sherry Tongshuang, Chang, Joseph C., and Kittur, Aniket. ACM UIST. 2023.
- [C.8] ComLittee: Literature Discovery with Personal Elected Author Committees. Kang, Hyeonsu. B., Soliman, Nouran., Latzke, Matt., Chang, Joseph C., and Bragg, Jonathan. ACM CHI. 2023.

<sup>&</sup>lt;sup>7</sup>https://rb.gy/acdfru

- [C.9] Threddy: An Interactive System for Personalized Thread-based Exploration and Organization of Scientific Literature. Kang, Hyeonsu. B., Chang, Joseph C., Kim, Yongsung., and Kittur, Aniket. ACM UIST. 2022.
- [C.10] From Who You Know to What You Read: Augmenting Scientific Recommendations with Implicit Social Networks. Kang, Hyeonsu. B., Kocielnik, Rafal, Head, Andrew, Yang, Jiangjiang, Latzke, Matt, Kittur, Aniket, Weld, Daniel S., Downey, Doug, and Bragg, Jonathan. ACM CHI. 2022.
- [C.11] Scaling Creative Inspiration with Fine-Grained Functional Aspects of Ideas. Hope, Tom, Tamari, Ronen, Hershcovich, Daniel, Kang, Hyeonsu. B., Chan, Joel, Kittur, Aniket, and Shahaf, Dafna. ACM CHI. 2022.
- [C.12] Augmenting Scientific Creativity with an Analogical Search Engine. Kang, Hyeonsu. B., Qian, Xin, Hope, Tom, Shahaf, Dafna, Chan, Joel, and Kittur, Aniket.
  ACM TOCHL 2022

ACM TOCHI. 2022.

- [C.13] Paragon: An Online Gallery for Enhancing Design Feedback with Visual Examples. Kang, Hyeonsu. B., Amoako, Gabriel, Sengupta, Neil, and Dow, Steven P. ACM CHI. 2018.
- [C.14] Omnicode: A Novice-Oriented Live Programming Environment with Always-On Run-Time Value Visualizations. Kang, Hyeonsu and Guo, Philip J. ACM UIST. 2017.

LIGHTLY PEER-REVIEWED WORKSHOP PAPERS

[W.1] Inkspire: Sketching Product Designs with AI. Lin, David Chuan-En, Kang, Hyeonsu. B., Martelaro, Nikolas, Kittur, Aniket, Chen, Yan-Ying, and Hong, Matthew K.
ACM LUST (Descent) 2024

ACM UIST (Poster). 2024.

- [W.2] Inkspire: Supporting Designers to Prototype Product Designs through Sketching. Lin, David Chuan-En, Kang, Hyeonsu. B., Martelaro, Nikolas, Kittur, Aniket, Chen, Yan-Ying, and Hong, Matthew K. ACM CHI (GenAI Workshop). 2024.
- [W.3] BioSpark: An End-to-End Generative System for Biological-Analogical Inspirations and Ideation. Kang, Hyeonsu. B., Lin, David Chuan-En, Martelaro, Nikolas, Kittur, Aniket, Chen, Yan-Ying, and Hong, Matthew K. ACM CHI (Late-Breaking Work). 2024.
- [W.4] BioSpark: An End-to-End Generative System for Biological-Analogical Inspirations and Ideation. Kang, Hyeonsu. B., Lin, David Chuan-En, Martelaro, Nikolas, Kittur, Aniket, Chen, Yan-Ying, and Hong, Matthew K. NeurIPS (Machine Learning for Creativity and Design Workshop). 2023.
- [W.5] Augmenting Scientific Creativity with Retrieval across Knowledge Domains. Kang, Hyeonsu. B.\*, Mysore, Sheshera\*, Huang, Kevin J\*, Chang, Haw-Shiuan, Prein, Thorben, McCallum, Andrew, Kittur, Aniket, and Olivetti, Elsa.

NAACL (Workshop on Bridging Human-Computer Interaction and Natural Language Processing). 2022.

[W.6] Matching Open Innovation Projects for Analogical Feedback Exchange. Kang, Hyeonsu. B., Ng, Felicia., and Kittur, Aniket. ACM Collective Intelligence. 2019.

	[W.7]	Custom Blocks in StarLogo Nova: A Template-Based Appr straction for Improved Ease of Use and Expressive Power. Kar Wu, David, and Wendel, Daniel. ACM OOPSLA. 2018.	roach to Ab- ng, Hyeonsu,		
	Patent [P.1]	S System and Method for Curating Large-Scale Biological-Ar spirations and Ideation. Kang, Hyeonsu. B., Lin, David Chua laro, Nikolas, Kittur, Aniket, Chen, Yan-Ying, and Hong, Matth United States Patent Application 18/423928. 2025.	n <mark>alogical In-</mark> n-En, Marte- lew K.		
	[P.2]	A Sketch-based Interface to Support Designers in Using G Guided by Analogic Concepts. Lin, David Chuan-En, Kang, I Martelaro, Nikolas, Kittur, Aniket, Chen, Yan-Ying, and Hong, Patent under review by the United States Patent and Trademark	enerative AI Hyeonsu. B., Matthew K. Office. 2023.		
PRESS	How AI can Make Work More Efficient and Creative When Future Users Help				
	The Lin For mo MIT No	is Design. Ik magazine from the CMU School of Computer Science. re open and equitable public discussions on social media, try "n ews.	Fall, 2024. heronymity". April, 2024.		
INVITED TALKS	Accelerating Innovation through AI-Powered Idea Abstraction and Interaction				
	Design Picnic H Fujitsu I Tableau Bloomb Allen Im Augmee Invited I Thredd Invited I Retriev Invited I	Health Research America Research Derg UX Research Institute for AI Enting Scientific Creativity with an Analogical Search Engine Paper Presentation at ACM SIGCHI By Paper Presentation at the Allen Institute for AI al across Knowledge Domains for Scientific Creativity Paper Presentation at NAACL	12/2024 11/2024 07/2024 07/2024 03/2024 03/2024 04/2023 [C.12] 09/2022 [C.9] 07/2022 [W.5]		
GRANTS	Researce Google Google Google	ch Gift, Allen Institute for AI, \$50,000 e Cloud Platform Credits, \$15,000 e Cloud Platform Credits, \$5,000 e Cloud Platform Credits, \$50,000	06/2022 05/2021 10/2020 09/2019		
TEACHING	Co-Ins School o Co-Ins	tructor. User Centered Research & Evaluation of Computer Science, Carnegie Mellon University tructor. Programming Usable Interfaces	Spring 2022 Fall 2020		
	School o Teachin	of Computer Science, Carnegie Mellon University ng Assistant. Prototyping	Spring 2017		
	Univers Teachin	ity of California, San Diego ng Assistant. Human-Computer Interaction Design	Fall 2016		
	Teachin	ng Assistant. Big Data Analytics	Spring 2016		
	Co-Ins Univers	tructor. Teaching skills in R, Python & Data Management	Winter 2016		
REVIEWING	ACM C 2023*, 2 [*×6]: 4	CHI (2025*, 2024*, 2023, 2022), UIST (2024 <sup>*×2</sup> , 2023*, 2022, 2020 2018) Six Special Recognitions for Outstanding Reviews	D), DIS (2025,		

SERVICE	Ph.D. in Human-Computer Interaction Admissions Committee
	School of Computer Science, Carnegie Mellon University

**REFERENCES** Available upon request

2023