Joseph Chee Chang

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Education

2013–2020 Ph.D., Language Technologies Institute, School of Computer Science, Carnegie Mellon University

Focus: *HCI/AI, Sensemaking, Intelligent User Interfaces, Crowdsourcing*

Thesis: *Supporting Global Context under Evolving User Intents during Data Exploration.*

Committee: Aniket Kittur (CMU, Chair), Jeffrey Bigham (CMU), Adam Perer (CMU), and David Karger (MIT)

2010–2012 M.S., Information Systems, National Tsing-Hua University

Thesis: *Mining Named-Entity Translation and Transliteration Pairs on the Web.* (ACL 2012 oral) Advisor: Roger Jang

2006–2010 B.S., Computer Science, Yuan Ze University

Independent Study: *A 3D Integrated Circuit Partitioning Algorithm.* Advisor: Yi-Yu Liu

Appointments

2021– Research Scientist, Semantic Scholar, Allen Institute for Artificial Intelligence (AI2)

2020–2021 Postdoctoral Fellow, Center for Knowledge Acceleration, Carnegie Mellon University

Research and commercialization of my thesis work with a startup team of researchers, engineers, designers and product managers.

2016 Summer Research Intern, Microsoft Research, Redmond

Focus: Crowdsourcing and Machine Learning (work published in CHI 2017)

Mentors: Saleema Amershi and Ece Kamar.

2013 Search Software Engineer, Yahoo Inc.

Search query and click log analysis using Hadoop for the Yahoo Knowledge Graph

2009–2011 Research Assistant (part-time), Academia Sinica

An EM-based method for cross-lingual ontology mapping (WordNet and eHowNet)

Awards and Honors

2023	ACM CHI Best Paper Award (1%)
2021	ACM CHI Best Paper Honorable Mentions Award
2018	ACM CHI Best Paper Honorable Mentions Award
2016a	ACM CHI Best Paper Honorable Mentions Award
2016b	ACM CHI Best Paper Honorable Mentions Award
2016	AAAI HCOMP Encore Paper and Invited Talk
2015	Fellowship of the Yahoo InMind Projects at CMU
2015	Taiwan Government Scholarship for Studying Abroad
2011	First Place (1/170), Taipei City Government Mobile App Development Competition
2010	Third Award, National IC/CAD Algorithm Contest, Dept. of Education Taiwan
2010	Second Place (2/67), Trend Micro Programming Contest
2008	Undergraduate Research Thesis Award

Teaching and Mentoring

Guest Lecture

2023	Human-AI Interaction & Systems (Dr. Anhong Guo)	University of Michigan
2020	Advanced User Interface Software (Dr. Brad Myers)	Carnegie Mellon University
2019	HCI Process and Theory (Dr. Aniket Kittur)	Carnegie Mellon University

Mentoring

2023	PhD Research Interns x3	Allen Institute for AI
2022	PhD Research Interns x4	Allen Institute for AI
2019	1 capstone team in the Master of HCI program	Carnegie Mellon University
2017	REU Summer Internship Program (3 undergrads)	Carnegie Mellon University
2015	REU Summer Internship Program (3 undergrads)	Carnegie Mellon University
2014	REU Summer Internship Program (2 undergrads)	Carnegie Mellon University

Teaching Assistant

2018	Data Science Capstone Course	Carnegie Mellon University
2018	Applied Machine Learning	Carnegie Mellon University
2012	Intro to Natural Language Processing	National Tsing-Hua University
2009	Intro to Computer Architecture	Yuan Ze University

Publications

Peer-reviewed Conferences and Journals

[1] Joseph Chee Chang, Amy X. Zhang, Jonathan Bragg, Andrew Head, Kyle Lo, Doug Downey, and Daniel S. Weld. 2023. CiteSee: Augmenting Citations in Scientific Papers with Persistent and Personalized Historical Context. In Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI). 15 pages. **(Best Paper Award 1%)** https://doi.org/10.1145/3544548.3580847

[2] Srishti Palani, Aakanksha Naik, Doug Downey, Amy X. Zhang, Jonathan Bragg, and Joseph Chee Chang. 2023. Relatedly: Scaffolding Literature Reviews with Existing Related Work Sections. In Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI). 19 pages. https://doi.org/10.1145/3544548.3580841

[3] Hyeonsu B. Kang, Nouran Soliman, Matt Latzke, Joseph Chee Chang, and Jonathan Bragg. 2023. ComLittee: Literature Discovery with Personal Elected Author Committees. In Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI). 20 pages. https://doi.org/10.1145/3544548.3581371

[4] Hyeonsu B. Kang, Joseph Chee Chang, Yongsung Kim, Aniket Kittur. 2022. Threddy: An Interactive System for Personalized Thread-based Exploration and Organization of Scientific Literature. In Proceedings of the 35th Annual Symposium on User Interface Software and Technology (UIST). ACM. 15 pages. https://doi.org/10.1145/3526113.3545660

[5] Andrew Kuznetsov, Joseph Chee Chang, Nathan Hahn, Napol Rachatasumrit, Bradley Breneisen, Julina Coupland, Aniket Kittur. 2022. Fuse: In-Situ Sensemaking Support in the Browser. In Proceedings of the 35th Annual Symposium on User Interface Software and Technology (UIST). ACM. 15 pages. https://doi.org/10.1145/3526113.3545693

[6] Michael Xieyang Liu, Andrew Kuznetsov, Yongsung Kim, Joseph Chee Chang, Aniket Kittur, Brad A Myers. 2022. Wigglite: Low-cost Information Collection and Triage. In Proceedings of the 35th Annual Symposium on User Interface Software and Technology (UIST). ACM. 16 pages. https://doi.org/10.1145/3526113.3545661

[7] Joseph Chee Chang, Yongsung Kim, Victor Miller, Michael Xieyang Liu, Brad Myers, and Aniket Kittur. 2021. Tabs.do: Task-Centric Browser Tab Management. In Proceedings of the 33rd Annual Symposium on User Interface Software and Technology (UIST). ACM. 13 pages.

[8] Joseph Chee Chang, Nathan Hahn, Yongsung Kim, Julina Coupland, Bradley Breneisen, Hannah S Kim, John Hwong and Aniket Kittur. 2021. When the Tab Comes Due: Challenges in the Cost Structure of Tab Usage. Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI). ACM. 15 pages. **(Best Paper Honorable Mentions Award)** https://doi.org/10.1145/3411764.3445585

[9] Joseph Chee Chang, Nathan Hahn, and Aniket Kittur. 2020. Mesh: Scaffolding Comparison Tables for Online Decision Making. In Proceedings of the 33rd Annual Symposium on User Interface Software and Technology (UIST). ACM. 14 pages. https://doi.org/10.1145/3379337.3415865

[10] Joseph Chee Chang, Nathan Hahn, Adam Perer, and Aniket Kittur. 2019. SearchLens: composing and capturing complex user interests for exploratory search. In Proceedings of the 24th

International Conference on Intelligent User Interfaces (IUI). ACM. 12 pages. https://doi.org/10.1145/3301275.3302321

[11] Joel Chan, Joseph Chee Chang, Tom Hope, Dafna Shahaf, and Aniket Kittur. 2018. SOLVENT: A Mixed Initiative System for Finding Analogies between Research Papers. In Proceedings of the conference on Computer-Supported Cooperative Work (CSCW). 21 pages. https://doi.org/10.1145/3274300

[12] Ting-Hao (Kenneth) Huang, Joseph Chee Chang, and Jeffrey P. Bigham. 2018. Evorus: A Crowd-powered Conversational Assistant Built to Automate Itself Over Time. In Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI). ACM. 13 pages. **(Best Paper Honorable Mentions Award)** https://doi.org/10.1145/3173574.3173869

[13] Nathan Hahn, Joseph Chee Chang, and Aniket Kittur. 2018. Bento Browser: Complex Mobile Search Without Tabs. In Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI). ACM. 12. pages. https://doi.org/10.1145/3173574.3173825

[14] Joseph Chee Chang, Saleema Amershi, and Ece Kamar. 2017. Revolt: Collaborative Crowdsourcing for Labeling Machine Learning Datasets. In Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI). ACM. 13 pages. https://doi.org/10.1145/3025453.3026044

[15] Joseph Chee Chang, Aniket Kittur, and Nathan Hahn. 2016. Alloy: Clustering with Crowds and Computation. In Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI). ACM. 12 pages. **(Best Paper Honorable Mentions Award)** https://doi.org/10.1145/2858036.2858411

[16] Nathan Hahn, Joseph Chang, Ji Eun Kim, and Aniket Kittur. 2016. The Knowledge Accelerator: Big Picture Thinking in Small Pieces. In Proceedings of the CHI Conference on Human Factors in Computing Systems (CHI). ACM. 13 pages. **(Best Paper Honorable Mentions Award)** https://doi.org/10.1145/2858036.2858364

[17] Joseph Chee Chang, Nathan Hahn, and Aniket Kittur. 2016. Supporting Mobile Sensemaking Through Intentionally Uncertain Highlighting. In Proceedings of the 29th Annual Symposium on User Interface Software and Technology (UIST). ACM. 8 pages. https://doi.org/10.1145/2984511.2984538

[18] Joseph Chang, Jason Chang, Roger Jang. 2012. Learning to find translations and transliterations on the web. In Proceedings of the 50th Annual Meeting of the Association for Computational Linguistics (ACL oral presentation). 5 pages. https://www.aclweb.org/anthology/P12-2026.pdf

[19] Chang, J. Z., Tsai, R. T. H., and Chang, J. S. 2009. Wikisense: Supersense tagging of wikipedia named entities based wordnet. In Proceedings of the 23rd Pacific Asia Conference on Language, Information and Computation (PACLIC). 10 pages.

[20] Chang, J. Z., Yen, T. H., & Tsai, R. T. H. 2009. Minimally supervised question classification and answering based on WordNet and Wikipedia. In Proceedings of the 21st Conference on Computational Linguistics and Speech Processing. 14 pages.

Workshops, Posters, Preprints

[1] Kyle Lo, Joseph Chee Chang, Andrew Head, Jonathan Bragg, Amy X. Zhang, Cassidy Trier, Chloe Anastasiades, Tal August, Russell Authur, Danielle Bragg, Erin Bransom, Isabel Cachola,

Stefan Candra, Yoganand Chandrasekhar, Yen-Sung Chen, Evie Yu-Yen Cheng, Yvonne Chou, Doug Downey, Rob Evans, Raymond Fok, Fangzhou Hu, Regan Huff, Dongyeop Kang, Tae Soo Kim, Rodney Kinney, Aniket Kittur, Hyeonsu Kang, Egor Klevak, Bailey Kuehl, Michael Langan, Matt Latzke, Jaron Lochner, Kelsey MacMillan, Eric Marsh, Tyler Murray, Aakanksha Naik, Ngoc-Uyen Nguyen, Srishti Palani, Soya Park, Caroline Paulic, Napol Rachatasumrit, Smita Rao, Paul Sayre, Zejiang Shen, Pao Siangliulue, Luca Soldaini, Huy Tran, Madeleine van Zuylen, Lucy Lu Wang, Christopher Wilhelm, Caroline Wu, Jiangjiang Yang, Angele Zamarron, Marti A. Hearst, Daniel S. Weld. 2023. The Semantic Reader Project: Augmenting Scholarly Documents through AI-Powered Interactive Reading Interfaces. arXiv:2303.14334.

[2] Zejiang Shen, Tal August, Pao Siangliulue, Kyle Lo, Jonathan Bragg, Jeff Hammerbacher, Doug Downey, Joseph Chee Chang, David Sontag. 2023. Beyond Summarization: Designing AI Support for Real-World Expository Writing Tasks. The Second Workshop on Intelligent and Interactive Writing Assistants. The Second Workshop on Intelligent and Interactive Writing Assistants (In2Writing Workshop @ CHI).

[3] Ting-Hao Kenneth Huang, Joseph Chee Chang, Saiganesh Swaminathan, and Jeffrey P. Bigham. 2017. Evorus: A Crowd-powered Conversational Assistant That Automates Itself Over Time. In Proceedings of the 30th Annual ACM Symposium on User Interface Software and Technology (UIST Posters). ACM. https://doi.org/10.1145/3131785.3131823

[4] Aniket Kittur, Joseph Chee Chang, Nathan Hahn, Ji Eun Kim. 2016. Bigger Thinking Through Micro-Tasks. In the Workshop on Productivity Decomposed: Getting Big Things Done with Little Microtasks (CHI Workshop). ACM.

[5] Wu, J. C., Chang, J. Z., Chen, Y., Huang, S. T., Chen, M. H., & Chang, J. S. 2012. Helping our own: NTHU NLPLAB system description. In Proceedings of the Seventh Workshop on Building Educational Applications Using NLP (NAACL Workshop).

[6] Chang, J. Z., & Chang, J. S. 2012. Word root finder: a morphological segmentor based on CRF. In Proceedings of COLING 2012: Demonstration Papers.

Patents

[1] Joseph Chee Chang and Aniket Kittur, (2021). U.S. Patent Pending.

[2] Aniket Kittur, Nathan Hahn, and Joseph Chee Chang. Methods of Providing a Search-Ecosystem User Interface For Searching Information Using a Software-Based Search Tool and Software for Same (2019). U.S. Patent Application No. 16/463,068. US20190286683A1.

Grants (Co-wrote with PI Aniket Kittur)

2020 Office of Navel Research Grant

"*Externalizing and Aggregating Structured Mental Representations*"

2019 Google Faculty Research Award

"*Modeling and Augmenting Sensemaking and Exploratory Search*" (renewed)

2018 Google Faculty Research Award

"*Modeling and Augmenting Sensemaking and Exploratory Search*"

2017 National Science Foundation AIR-TT Grant

"*Supporting Complex Sensemaking on Mobile Phones*"

2016 Google Faculty Research Award

"*Supporting Complex Sensemaking on Mobile Phones*"

2015 Yahoo! InMind Projects at CMU

"*From Search Results to Search Landscapes*"

Service

2018-present	ACM CSCW	Reviewer
2018-present	ACM UIST	Reviewer
2018-present	ACM CHI	Reviewer
2019	AAAI	Reviewer
2019	Elsevier FGCS	Reviewer
2016	ACM CHIIR	Student Volunteer

Selected Media Coverage

[1] Mashable: Stop trying to work in multiple browser tabs. It's terrible for your focus. - Tab hoarding gives the illusion that multitasking is possible, but it's not. Rebecca Ruiz. https://mashable.com/article/too-many-tabs-open

[2] Fast Company: The twisted psychology of browser tabs—and why we can't get rid of them - New research proves that it's not just you: Browser tabs are scientifically terrible. Mark Wilson. https://www.fastcompany.com/90635776/the-twisted-psychology-of-browser-tabs-and-why-we-cant-get-rid-of-them

[3] Metro New UK: Suffer from 'tab overload'? Scientists study why we have so many open. Katherine Hignett. https://metro.co.uk/2021/05/10/suffer-from-tab-overload-scientists-study-why-we-have-so-many-open-14540577/amp/

Technical Keywords

$^{+}$ indicates proficient / strong expertise

General Languages	$^{+}$Python, $^{+}$Java, Ruby, C, Objective-C
Web Front-End	$^{+}$ReactJS, $^{+}$D3, $^{+}$Modern CSS JavaScript & Typescript, $^{+}$Chrome Extensions
Web Back-End	$^{+}$SQL, $^{+}$Firebase/Firestore/Functions, $^{+}$MeteorJS/TurkServer, Flask, Rails
Stats, Data, and NLP	R, $^{+}$Numpy/Scipy, $^{+}$NLTK, TensorflowJS, Hadoop MapReduce, $^{+}$Mechnical Turk
Understanding Users	User Studies, Interviews, Surveys, Grounded Theory

References

Available on request.