Joseph Chee Chang

PhD Student
Computer Science
Carnegie Mellon University

I am interested in how people explore, structure, and **make sense of new information in complex decision-making scenarios** such as exploratory search and learning from data. For this, I apply **crowdsourcing, NLP, and ML** techniques to research and build **intelligent information systems with novel interfaces** that augment human cognition to enhance learning, knowledge production, and scientific discovery. My research is supported by Google, Bosch, Yahoo, and the NSF.

Contact

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Technical

Mobile
ObjC/iOS • Java/Android

Frontend
ReactJS • ES7 • HTML5 • D3

Backend
MeteorJS • Flask • Rails • SQL • Firebase

ML/NLP/Stats
Hadoop • Python • NLTK • Theano • R

Crowdsourcing
real-time systems
interactive workflows
human-in-the-loop ML

Education

2013 - **PhD, Computer Science - HCI+ML focus** *Carnegie Mellon U*
Won course competitions for *Algorithms for NLP* and *Language&Stats*. CHI best paper honorable mentions x3. Advisor: Aniket Kittur.

2010 - 2012 **MS, Computer Science - NLP focus** *NTHU (Taiwan)*
Thesis work published in ACL 2012 (20%). Advisor: Roger Jang.

2006 - 2010 **BS, Computer Science - EDA focus** *YZU (Taiwan)*
Independent Study: FPGA technology mapping.

Experience

Summer 2016 **Microsoft PhD Research Intern** *Microsoft Research*
Machine Learning. Mentors: Saleema Amershi and Ece Kamar.

Summer '14,'15,'17 **REU Internship Program Research Mentor** *HCI Institute, CMU*
Mentored a total of 8 research interns over three Summers.

April-July 2013 **Yahoo! Search Engineer** (fulltime) *Yahoo*
Yahoo Knowledge Graph and search log mining using Hadoop.

Fall 2012 **Teaching Assistant - Intro to NLP** *NTHU (Taiwan)*
Recitations and Lab Sessions with 4+ hours of teaching per week.

2009-2011 **Research Assistant** *Academia Sinica*
EM-based algorithm on Hadoop for cross-lingual ontology mapping.

April-June 2012 **Contractor Developer** *OpenMoko (startup)*
Developed an Android client for an online social network.

May-Sept. 2010 **Software Engineer Intern** *OxLab (startup)*
An open source Android benchmark tools used by major smartphone companies and shipped with Texas Instrument's products.

Awards and Honors

2016 **HCOMP Invited Encore Talk** *AAAI HCOMP*
Alloy: Clustering with Crowds and Computation

2011 **First Place, Fun Taipei App Competition** *Taipei City Gov.*
170 teams. Developed a city tour guide app for iOS and Android.

2010 **Third Award, EDA Programming Contest** *Dept. of Education, Taiwan*
160 teams (<10%). Developed a 3D-IC partitioning algorithm (3000 lines of C++) to compete on speed and circuit optimization.

2010 **Best Student Project, Mobile UI Contest** *Dept. of Economics, Taiwan*
Paper Piano: an Android augmented reality piano.

2010 **Second Place, Trend Micro Programming Contest** *Trend Micro*
67 teams. Mobile application development competition.

2009 **Conference for Open Source Coders, Users and Promoters***(COSCUP)*
Presented an Android benchmarking project at the largest OSS conference in Asia.

Grants

2016 **NSF AIR-TT Grant - co-wrote** *PI: Aniket Kittur*
Supporting Complex Sensemaking on Mobile Phones

2015, 2018 - 2019 **Google Faculty Research Award x3 - co-wrote** *PI: Aniket Kittur*
Supporting Complex Sensemaking on Mobile Phones
Modeling and Augmenting Sensemaking and Exploratory Search

2015 **Yahoo! InMind Project - co-wrote** *PI: Aniket Kittur*
From Search Results to Search Landscapes

Publications (selected)

Chang, J. C., Hahn, N., Perer, A., and Kittur, A. 2019. Searchlens: Composing and capturing complex user interests for exploratory search. In *Proc. the 24th International Conference on Intelligent User Interfaces (ACM IUI, 25%)*.

Huang, T.-H. K., Chang, J. C., and Bigham, J. P. 2018. Evorus: A crowd-powered conversational assistant built to automate itself over time. In *ACM SIGCHI (25%, **Best Paper Honorable Mention Award**🏆)*.

Hahn, N., Chang, J. C., and Kittur, A. 2018. Bento Browser: Navigating with search. In *ACM SIGCHI (25%)*.

Chan, J., Chang, J. C. Hope, T., Shahaf, D., and Kittur, A. 2018. Solvent: A mixed initiative system for finding analogies between research papers. In *ACM CSCW*.

Chang, J. C., Amershi, S., and Kamar, E. 2017. Revolt: Collaborative crowdsourcing for labeling machine learning datasets. In *ACM SIGCHI (25%)*.

Chang, J. C., Hahn, N., and Kittur, A. 2016. Supporting mobile sensemaking through intentionally uncertain highlighting. In *ACM UIST (20.6%)*.

Hahn, N., Chang, J. C., Kim, J. E., and Kittur, A. 2016. Knowledge accelerator: Big picture thinking in small pieces. In *ACM SIGCHI (23%, **Best Paper Honorable Mention Award**🏆)*.

Chang, J. C., Kittur, A., and Hahn, N. 2016. Alloy: Clustering with crowds and computation. In *ACM SIGCHI (23%, **Best Paper Honorable Mention Award**🏆)*.

Chang, J., Chang, J. S., and Jang, R. J.-S. 2012. Learning to find translations and transliterations on the web. In *Annual Meeting of the ACL (20%)*.

Chang, J. C., Chang, J. S., and Jang, J.-S. R. 2013. Learning to find translations and transliterations on the web based on conditional random fields. *Journal: Computational Linguistics & Chinese Language Processing*.

Chang, J. Z. and Chang, J. S. 2012. Word root finder: a morphological segmentor based on crf. In *COLING (Demos)*.

Wu, J.-C., Joseph Chang, Chen, Y.-C., Huang, S.-T., Chen, M.-H., and Chang, J. S. 2012. NTHU NLPLAB system description. In *NAACL 7th Workshop on Building Educational Applications Using NLP*. North American Chapter of the Association for Computational Linguistics (NAACL workshop).

Chang, J., Yen, T.-H., and Tsai, T.-H. 2009. Minimally supervised question classification and answering based on wordnet and wikipedia. In *Proc. of the 21st Conference on Computational Linguistics and Speech Processing*.

Chang, J., Tsai, R. T.-H., and Chang, J. S. 2009. Wikisense: Supersense tagging of wikipedia named entities based wordnet. In *Proc. of Pacific Asia Conference on Language, Information and Computation (PACLIC, 25%)*.

Engineering Projects (full list: `http://joseph.nlpweb.org/portfolio/`)

KerKerInput: I co-wrote the first ever Chinese input method for the Android platform. It supports smart word ranking and next-word prediction. (2010. Java, Android. `https://github.com/josephcc/KerKerInput`)

0xBench: An open source Android benchmark tool used by developers and major companies worldwide (including Samsung, LG, and Linaro). Texas Instrument shipped 0xBench with its development boards. (2011. Java, C, Android)

TaipeiFever: A tour guide app written for the Taipei City Government. Its prototype won first place (<0.6%) at a developer competition. (2011. iOS, Android, WindowsPhone. `https://speakerdeck.com/josephcc/taipeifever`)

SideKick: An iPhone app that automatically solves the (once) popular game Draw Something by scanning in-game screenshots. (2012. ObjC, iOS. `https://www.youtube.com/watch?v=g3_TMp7IJB0`)

RePhrase An context-aware thesaurus designed to help writers find alternative expressions for a given phrase. Includes 8,810,629 phrases and 53,575 examples mined from the Web. (2011. iOS)