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Education

- **Ph.D., Language and Information Technologies**
School of Computer Science, Carnegie Mellon University, 2013 – Present
Advisor: Dr. Jeffrey P. Bigham.
- **M.S., Language and Information Technologies**
School of Computer Science, Carnegie Mellon University, 2011 – 2013
Advisor: Dr. Teruko Mitamura.
- **M.S., Computer Science**
The Graduate Institute of Networking and Multimedia, National Taiwan University, 2007 – 2009
Advisors: Dr. Hsin-Hsi Chen.
- **B.S., Computer Science**
Dept. Computer Science and Information Engineering, National Taiwan University, 2003 – 2007
- **B.A., Chinese Literature (Double Major)**
Dept. Chinese Literature, National Taiwan University, 2003 – 2007

Awards and Honors

- Honourable Mention Award (Top 5%), CHI 2018
- Best Paper Honorable Mention Award (Top 5%), CHI LBW 2016
- Yahoo! Fellowship of the InMind project at CMU, 2014 – Present
- Best Poster Award, LTI Student Research Symposium 2013

Peer-Reviewed Conference Papers

[C.14] Sheng-Yeh Chen, Chao-Chun Hsu, Chuan-Chun Kuo, **Ting-Hao K. Huang**, Lun-Wei Ku. (2018). EmotionLines: An Emotion Corpus of Multi-Party Conversations. In Proceedings of the 11th edition of the Language Resources and Evaluation Conference (**LREC 2018**), 7-12 May 2018, Miyazaki, Japan.



[C.13] **Ting-Hao K. Huang**, Joseph Chee Chang, Jeffrey P. Bigham. (2018). Evorus: A Crowd-powered Conversational Assistant Built to Automate Itself Over Time. In Proceedings of Conference on Human Factors in Computing Systems 2018 (**CHI 2018**), 2018, Montréal, Canada. (Acceptance Rate = 25.8%)
[Honourable Mention Award, Top 5% \(101 out of 2500 submissions\)](#)

- [C.12] **Ting-Hao K. Huang**, Jeffrey P. Bigham. (2017). A 10-Month-Long Deployment Study of On-Demand Recruiting for Low-Latency Crowdsourcing. In Proceedings of The fifth AAAI Conference on Human Computation and Crowdsourcing (**HCOMP 2017**), 2017, Quebec City, Canada. (Acceptance Rate = 28.9%)
- [C.11] Saiganesh Swaminathan, Raymond Fok, Fanglin Chen, **Ting-Hao K. Huang**, Irene Lin, Rohan Jadvani, Walter S. Lasecki, Jeffrey P. Bigham. (2017). WearMail: On-the-Go Access to Information in Your Email with a Privacy-Preserving Human Computation Workflow. In Proceedings of 30th ACM Symposium on User Interface Software and Technology (**UIST 2017**), 2017, Quebec City, Canada. (Acceptance Rate = 22.5%)
- [C.10] **Ting-Hao K. Huang**, Yun-Nung Chen, Jeffrey P. Bigham. (2017). Real-time On-Demand Crowd-powered Entity Extraction. In Proceedings of the 5th Edition Of The Collective Intelligence Conference (**CI 2017**, oral presentation), 2017, New York University, NY, USA.
- [C.9] **Ting-Hao K. Huang**, Walter S. Lasecki, Amos Azaria, Jeffrey P. Bigham. (2016). "Is there anything else I can help you with?": Challenges in Deploying an On-Demand Crowd-Powered Conversational Agent. Conference on Human Computation & Crowdsourcing (**HCOMP 2016**), November, 2016, Austin, TX, USA. (Acceptance Rate = 30.3%).
- [C.8] **Ting-Hao K. Huang**, Francis Ferraro, Nasrin Mostafazadeh, Ishan Misra, Jacob Devlin, Aishwarya Agrawal, Ross Girshick, Xiaodong He, Pushmeet Kohli, Dhruv Batra, Larry Zitnick, Devi Parikh, Lucy Vanderwende, Michel Galley, Margaret Mitchell. (2016). Visual Storytelling. In proc. the 15th Annual Conference of the North American Chapter of the Association for Computational Linguistics (**NAACL 2016**), June, 2016, San Diego, CA, USA. (Acceptance Rate = 29%).
- [C.7] **Ting-Hao K. Huang**, Walter S. Lasecki, Jeffrey P. Bigham. (2015). Guardian: A Crowd-Powered Spoken Dialog System for Web APIs. Conference on Human Computation & Crowdsourcing (**HCOMP 2015**), November, 2015, San Diego, USA. (Acceptance Rate = 30%).
- [C.6] Francis Ferraro, Nasrin Mostafazadeh, **Ting-Hao K. Huang**, Lucy Vanderwende, Jacob Devlin, Michel Galley, Margaret Mitchell. (2015). A Survey of Current Datasets for Vision and Language Research. Conference on Empirical Methods in Natural Language Processing (**EMNLP 2015**), September, 2015, Lisbon, Portugal. (Acceptance Rate = 24%, 312/1315).
- [C.5] Ho-Cheng Yu, **Ting-Hao K. Huang**, Hsin-Hsi Chen. (2012). Domain Dependent Word Polarity Analysis for Sentiment Classification. Proceedings of the 24th ROCLING (**ROCLING 2012**) conference.
- [C.4] Lun-Wei Ku, **Ting-Hao K. Huang**, Hsin-Hsi Chen. (2011). Predicting Opinion Dependency Relations for Opinion Analysis. Proceeding of IJCNLP (**IJCNLP 2011**). (Acceptance Rate = 36%)
- [C.3] **Ting-Hao K. Huang**, Lun-Wei Ku, Hsin-Hsi Chen. (2010). Predicting Morphological Types of Chinese Bi-Character Words by Machine Learning Approaches. Proceedings of LREC (**LREC 2010**), Malta, pp. 844–850.
- [C.2] Lun-Wei Ku, **Ting-Hao K. Huang**, and Hsin-Hsi Chen. (2010). Construction of a Chinese Opinion Treebank. Proceeding of LREC (**LREC 2010**), Malta, pp. 1315–1319.
- [C.1] Lun-Wei Ku, **Ting-Hao K. Huang**, and Hsin-Hsi Chen. (2009). Using Morphological and Syntactic Structures for Chinese Opinion Analysis. Proceedings of EMNLP (**EMNLP 2009**), Singapore, pp. 1260–1269. (Acceptance Rate = 34%)

Peer-Reviewed Journal Articles

- [J.3] **Ting-Hao K. Huang**, Amos Azaria, Oscar Romero, Jeffrey P. Bigham. InstructableCrowd: Creating IF-THEN Rules for Smartphones via Conversations with the Crowd. *ACM Transactions on Computer-Human Interaction (TOCHI)*.
Under Review. 1st-Round Decision: Major Revision
- [J.2] **Ting-Hao K. Huang**: Social Metaphor Detection via Topical Analysis. *International Journal of Computational Linguistics and Chinese Language Processing (IJCLCLP)*, 19(2) (2014). (Published)
- [J.1] Ho-Cheng Yu, **Ting-Hao K. Huang**, and Hsin-Hsi Chen. (2012). Domain Dependent Word Polarity Analysis for Sentiment Classification. *International Journal of Computational Linguistics and Chinese Language Processing (IJCLCLP)*, 17(3-4): Special Issue on ROCLING 2012. (Published)

Workshop, Symposia, and Consortia Papers

- [W.5] Saiganesh Swaminathan, **Ting-Hao K. Huang**, Irene Lin, Anhong Guo, Gierad Laput, and Jeffrey P. Bigham. (2017). Epistemo: A Crowd-Powered Conversational Search Interface. In the Talking with Conversational Agents in Collaborative Action Workshop at the 20th ACM conference on Computer-Supported Cooperative Work and Social Computing.
- [W.4] Chieh-Yang Huang, **Ting-Hao K. Huang**, Lun-Wei Ku. (2017). Challenges in Providing Automatic Affective Feedback in Instant Messaging Applications. In the Designing the User Experience of Machine Learning Systems symposium (**AAAI 2017 Spring Symposium Series**), March 27-29, 2017, Palo Alto, USA.
- [W.3] **Ting-Hao K. Huang**. Crowd-Powered Conversational Agents. Doctoral Consortium of Conference on Human Computation & Crowdsourcing (**HCOMP DC 2016**), 2016, Austin, TX, USA.
-  [W.2] **Ting-Hao K. Huang**, Yun-Nung Chen, Lingpeng Kong. (2015). ACBiMA: Advanced Chinese Bi-Character Word Morphological Analyzer. The 8th SIGHAN Workshop on Chinese Language Processing (**SIGHAN 2015**), July 30-31, 2015, Beijing, China. (Acceptance Rate = 29%).
[Best Poster Award of LTI Student Research Symposium 2013](#)
- [W.1] **Ting-Hao K. Huang**. (2013). Social Metaphor Detection via Topical Analysis. *IJCNLP 2013 Workshop on Natural Language Processing for Social Media (SocialNLP 2013)*, pages 14–22, Nagoya, Japan, 14 October 2013. (Acceptance Rate = 35%).

Demos

- [D.3] Chieh-Yang Huang, Tristan Labetoulle, **Ting-Hao K. Huang**, Yi-Pei Chen, Hung-Chen Chen, Vallari Srivastava, and Lun-Wei Ku. MoodSwipe: A Soft Keyboard that Suggests Messages Based on User-Specified Emotions. In the Demo track of the Conference on Empirical Methods in Natural Language Processing 2017 (**EMNLP Demo 2017**), Sep, 2017, Copenhagen, Denmark.
- [D.2] Shih-Ming Wang, Chun-Hui Li, Yu-Chun Lo, **Ting-Hao K. Huang**, Lun-Wei Ku. (2016). Sensing Emotions in Text Messages: An Application and Deployment Study of EmotionPush. In the demo track of the 26th International Conference on Computational Linguistics (**COLING Demo 2016**), Dec, 2016, Osaka, Japan.
- [D.1] **Ting-Hao K. Huang**, Ho-Cheng Yu and Hsin-Hsi Chen. (2012). Modeling Pollyanna Phenomena in Chinese Sentiment Analysis. In the demo track of the COLING 2012 (**COLING Demo 2012**).

Posters and Extended Abstracts

[A.4] Jeffrey P. Bigham, Raja Kushalnagar, **Ting-Hao K. Huang**, Juan Pablo Flores and Saiph Savage. On How Deaf People Might Use Speech to Control Devices. In the Poster track ASSETS 2017 (**ASSETS Poster 2017**), October, 2017. Baltimore, Maryland.

[A.3] **Ting-Hao K. Huang**, Joseph Chee Chang, Saiganesh Swaminathan, Jeffrey P. Bigham. Evorus: A Crowd-powered Conversational Assistant That Automates Itself Over Time. In the Poster track of the 20th ACM Symposium on User Interface Software and Technology (**UIST Poster 2017**), October, 2017. Quebec City, Canada.



[A.2] **Ting-Hao K. Huang**, Amos Azaria, Jeffrey P. Bigham. (2016). InstructableCrowd: Creating IF-THEN Rules via Conversations with the Crowd. In CHI '16 Late-Breaking Work on Human Factors in Computing Systems (**CHI LBW 2016**), May, 2016, San Jose, CA, USA.
[Best Paper Honorable Mention Award, Top 5% \(14 out of 281\)](#)

[A.1] **Ting-Hao K. Huang**, Walter S. Lasecki, Alan L. Ritter, Jeffrey P. Bigham. (2014). Combining Non-Expert and Expert Crowd Work to Convert Web APIs to Dialog Systems. Work-in-Progress paper in the Proceeding of Conference on Human Computation and Crowdsourcing (**HCOMP WIP 2014**), November 2-4, 2014, Pittsburgh, USA.

Theses and Proposals

[T.2] **Ting-Hao K. Huang**. (2017). A Crowd-Powered Conversational Assistant That Automates Itself Over Time. PhD thesis proposal, Language Technologies Institute, Carnegie Mellon University, Pittsburgh, PA, USA. January 11th, 2017.

[T.1] **Ting-Hao K. Huang**. (2009). Automatic Extraction of Intra- and Inter- word Syntactic Structures for Chinese Opinion Analysis (應用於中文意見分析之詞內暨詞間語法結構自動擷取研究). Master thesis, Graduate Institute of Networking and Multimedia (GINM), National Taiwan University, Taipei.

Research Experience and Projects

- **Carnegie Mellon University**, Pittsburgh, PA, USA, 09/2013 – Present.

Research Assistant, Advisor: Dr. Jeffrey P. Bigham.

Research Focuses: Crowd-powered System, Dialogue System, Crowdsourcing.

- **Evorus: A Crowd-powered Conversational Assistant that Automates Itself Over Time**



AI-crowd architectures have long been proposed as a way to reduce cost and latency for crowd-powered systems such as Chorus; Evorus demonstrates how automation can be introduced successfully in a deployed system.

[\[UIST Poster 2017\]](#) [\[CHI 2018\]](#)

- **Chorus: A Conversational Agent Powered by Crowdsourcing**

Chorus is the world's first deployed chatbot that is powered by real-time crowdsourcing. A group of crowd workers are recruited on-demand in real-time to chat with the user and try to solve their problems. Users can talk to Chorus via Google Hangouts for anything anytime, anywhere. **Chorus is available at:** <http://talkingtothecrowd.org/>

[\[HCOMP 2016\]](#) [\[CSCW Workshop 2017\]](#) [\[HCOMP 2017\]](#)

- **InstructableCrowd: Creating IF-THEN Rules via Conversations with the Crowd**
We present a system that allows end-users to instruct the crowd to create trigger-action (“if, then”) rules based on their needs. [ [CHI LBW 2016](#)] [[TOCHI \(Under Review\)](#)]
- **Guardian: Crowd-powered Conversational Interface for Web APIs**
We present a crowd-powered system that is able to generate a natural language interface for arbitrary web APIs from scratch without domain-dependent training data or knowledge. [[HCOMP WIP 2014](#)] [[HCOMP 2015](#)] [[CI Oral 2017](#)]
- **Institute of Information Science, Academia Sinica, Taipei, Taiwan, 01/2016 – 02/2016.**
Visiting Scholar, Host: Dr. Lun-Wei Ku.
Research Focuses: Computer-Mediated Communication, Emotion Detection, Sentiment Analysis.
 - **MoodSwipe: A Soft Keyboard that Suggests Messages Based on User-Specified Emotions**
MoodSwipe is a mobile phone keyboard that suggests text messages given the user-specified emotions utilizing the real dialog data. The aim of MoodSwipe is to create a convenient user interface to enjoy the technology of emotion classification and text suggestion, and at the same time to collect labeled data automatically for developing more advanced technologies. [[EMNLP Demo 2017](#)]
 - **EmotionPush: Detecting Emotions in Messages**
With the aim of providing affective feedback for instant messages, we introduced EmotionPush, a system that automatically detects the emotions of the messages that the users received on Facebook Messenger and provides corresponding colored notification on their smartphones. [[COLING Demo 2016](#)] [[AAAI Spring Symposia 2017](#)] [[LREC 2018](#)]
- **Microsoft Research, Redmond, WA, USA, 05/2015 – 08/2015.**
Research Intern, Host: Dr. Margaret Mitchell.
Research Focuses: Crowdsourcing, Visual Storytelling, Image Captioning
 - **Visual Storytelling Dataset (VIST)**
We introduce the first dataset for sequential vision-to-language, and explore how this data may be used for the task of visual storytelling. The dataset includes 81,743 unique photos in 20,211 sequences, aligned to descriptive and story language. [[EMNLP 2015](#)] [[NAACL 2016](#)]
- **Carnegie Mellon University, Pittsburgh, PA, USA, 09/2011 – 08/2013.**
Research Assistant, Advisor: Dr. Teruko Mitamura.
Research Focuses: Metaphor Detection and Interpretation.
 - **Metaphor Detection and Interpretation**
In the IARPA project “Metaphr”, we develop pipelines for metaphor detection and interpretation for English, Spanish, Russian, and Farsi. We explore various approaches, including modeling topics and selectional preferences of words, to identify metaphorical languages in social media and on-line forums. [[SocialNLP 2013](#)] [[IJCLCLP 2014](#)]
 - **ACBiMA: Advanced Chinese Bi-Character Word Morphological Analyzer**
Supervisor: Prof. Lori Levin
A side project of Chinese morphology. We develop a corpus based on a well-defined morphological type scheme covering both Chinese derived words and compound words. A morphological analyzer is further built from this corpus. [ [SIGHAN 2015](#)]
- **National Taiwan University, Taipei, Taiwan, 09/2006 – 06/2011.**
Research Assistant, Advisor: Dr. Hsin-Hsi Chen.
Research Focuses: Sentiment Analysis, Syntax, Morphology.

- **Chinese Opinion Treebank**
We develop the Chinese Opinion Treebank base on the regular Chinese Treebank. In this Opinion Treebank, information including opinions, their polarities, language use types are all defined and annotated. [LREC 2010]
- **Structural Information and Sentiment Analysis**
By introducing the syntactic and morphological information of Chinese language, we are able to improve the performance of sentiment classification. [EMNLP 2009] [IJCNLP 2011]
- **Pollyanna**
The Pollyanna phenomena describe the human tendency to use positive words more frequently than negative words. We perform detailed analyses of the Pollyanna phenomena in four Chinese corpora, and improve sentiment classification based on this phenomena. [COLING 2012]
- **Chinese Morphology**
A side project on classification of Chinese morphological types. [LREC 2010]
- **Domain Dependent Sentiment Analysis**
We model the sentiment among multiple corpora, and compare the bag-of-words features in each data set. [ROCLING 2012] [IJCLCLP 2012]

Professional Activity

- Co-organizer, **Workshop on Storytelling** at NAACL HLT 2018.
- Co-organizer, **Visual Storytelling Challenge** at ICCV17's 2nd workshop on Closing the Loop Between Vision and Language, Venice, Italy.
- Paper Reviewer: CHI 2017/2018, CHI LBW 2018, CSCW 2018, IMWUT (2017 Feb Round), SocialNLP 2016

Selected Invited Talks

- *Crowd Research: Labels, Workflows, and Crowd-Powered Systems*, at the IEEE/IBM Watson Talk Series of **West Virginia University**, Nov 13th, 2017.
- *Crowd Research: Labels, Workflows, and Crowd-Powered Systems*, at the Department of Computer Science and Information Engineering (CSIE), **National Taiwan University**, Sep 29th, 2017.
- *Crowd Research: Labels, Workflows, and Crowd-Powered Systems*, at the Institute of Information Science (IIS), **Academia Sinica, Taiwan**, Sep 26th, 2017.
- *Real-time Crowd-powered Slot Filling in Dialogue Systems*, at the Sphinx Lunch Talk Series of **Carnegie Mellon University**, Apr 2nd, 2015.
- *Crowd-powered Dialogue Systems*, at the Institute of Information Science (IIS), **Academia Sinica, Taiwan**, Aug 20th, 2015.

Softwares

- **Ting-Hao K. Huang. UIMA Regex.** Computer software. UIMA Regex. Vers. 4.0. Carnegie Mellon University, 23 Apr. 2013. Web. 03 Feb. 2015. <<https://sites.google.com/site/uimaregex/>>.

- **Ting-Hao K. Huang. Alt Text Editor.** Computer software. Alt Text Editor. Vers. 1. N.p., 25 Feb. 2015. Web. Class project of the “Web Accessibility” class (05-897 A3) at Carnegie Mellon University. Instructor: Prof. Jennifer Mankoff and Prof. Jeffrey Bigham. Project Website: <https://talkingtothecrowd.org/Chorus/AltText/>.

Tutorials

- **Ting-Hao K. Huang.** September, 2016. How to make a valid and good worker interface page for Amazon Mechanical Turk external HITs (In Chinese. 如何製作一個 Amazon Mechanical Turk 需要的外部網頁) . <https://tinyurl.com/y7wxgpbk>

Student Mentoring

- Katia Villevald (Undergraduate student, CMU, Summer 2017 REU Program)
- Jennifer Lee (Undergraduate student, CMU, Summer 2017 REU Program)
- Jason Chen (Undergraduate student, CMU, 2014 – 2015)
- Ho-Cheng Yu (Master student, National Taiwan University, 2010 – 2011)

Media Coverage

- TribLive. Aaron Aupperlee. (2018, Feb 8).
Chatbot developed at Carnegie Mellon uses humans to answer questions AIs can't.
<http://triblive.com/business/technology/13275597-74/chatbot-developed-at-carnegie-mellon-uses-humans-to-answer-questions-ais-cant>
- presstext. (2018, Feb 8).
KI-System “Evorus” wird zunehmend eigenständig: Von Menschen lernendes System beantwortet immer komplexere Fragen.
<https://www.presstext.com/#news/20180208014>
- CMU SCS News. Byron Spice. (2018, Feb 7).
Crowd Workers, AI Make Conversational Agents Smarter.
<https://www.cs.cmu.edu/news/crowd-workers-ai-make-conversational-agents-smarter>
- EurekAlert!. (2018, Feb 7).
Crowd workers, AI make conversational agents smarter: Human/machine hybrid system can answer wide array of questions.
https://www.eurekalert.org/pub_releases/2018-02/cmu-cwa020618.php
- The Register. Thomas Claburn. (2017, Aug 14).
Dismayed by woeful AI chatbots, boffins hired real people – and went back to square one.
https://www.theregister.co.uk/2017/08/14/chat_bots_work_better_with_people/
- The Stack. Martin Anderson. (2016, April 14).
Microsoft releases data-set for ‘emotional’ automated captioning.
<https://thestack.com/cloud/2016/04/14/microsoft-sind-dataset-captioning-narrative/>

- Microsoft Official Blog. Linn, Allison. (2016, April 14).
Teaching computers to describe images as people would.
<http://blogs.microsoft.com/next/2016/04/14/teaching-computers-to-describe-images-as-people-would/>
- VentureBeat. Novet, Jordan. (2016, April 14).
Microsoft researchers are teaching AI to write stories about groups of photos.
<http://venturebeat.com/2016/04/14/microsoft-ai-visual-storytelling/>
- WIRED AWAKE (2016, April 15).
WIRED Awake: 10 must-read articles for 15 April. WIRED.CO.UK.
<http://www.wired.co.uk/news/archive/2016-04/15/wired-awake-15-april>
- MIT Technology Review (2016, April 27).
Will Artificial Intelligence Win the Caption Contest?.
<https://www.technologyreview.com/s/601339/will-artificial-intelligence-win-the-caption-contest/#/set/id/601340/>

Honors as a Writer

- Invited member of “Mystery Writers of Taiwan”, 2010 – Present
- Mystery Fiction Award, by “Mystery Writers of Taiwan”, 2010
Short Story: “The Maiden’s Prayer”
- First Prize of “Taipei The Less” Essay Competition, 2005
Flash Fiction: “Genesis in Taipei.”

References

- **Jeffrey P. Bigham**
Associate Professor, Human-Computer Interaction Institute, Carnegie Mellon University, USA.
jbigham@cs.cmu.edu
- **Chris Callison-Burch**
Associate Professor, Computer and Information Science Department, University of Pennsylvania, USA.
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- **Alexander I. Rudnicky**
Research Professor, Computer Science Department, Carnegie Mellon University, USA.
air@cs.cmu.edu
- **Margaret Mitchell**
Senior Research Scientist, Google Research, USA.
margarmitchell@gmail.com
- **Walter S. Lasecki**
Assistant Professor, Computer Science & Engineering, University of Michigan, USA.
wlasecki@umich.edu
- **Lun-Wei Ku**
Assistant Research Fellow, Institute of Information Science, Academia Sinica, Taiwan.
lwku@iis.sinica.edu.tw

- **Hsin-Hsi Chen**

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