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Education

- **PhD. Student, Informatics**
  College of IST, Penn State University, Jan 2019 – Sep 2023
- **PhD. Student, Computer Science (transferred to PSU)**
  School of CIDSE, Arizona State University, Aug 2017 – Dec 2018
- **B.S., Electrical Engineering**
  Dept. Electrical Engineering, National Taiwan University, Sep 2010 – June 2014

Research Interest

I specialize in **Natural Language Processing (NLP)** and **Human Computer Interaction (HCI)**, creating AI-powered and crowd-powered tools to support language-related tasks. In particular, I develop tools to help (*i*) creative writing, (*ii*) scientific writing, (*iii*) figure captioning, (*iv*) language learning, (*v*) data annotation, and so on. I have expertise in language generation models and full-stack web development, and my research explores how people interact with these systems to derive maximum benefit.

Research Experience and Projects

- **Microsoft Research - Security AI**, Redmond, WA, USA, 05/2022 – 08/2022.
  Research Intern, Mentors: Dr. Jay Stokes.
  Research Focuses: Security AI and NLP.
  - **Summarizing Security Logs**
    The security logs hold behavior information about the malware. We investigated approaches to generate readable descriptions to document the malicious behavior from security logs.
    [Under Review]
- **Microsoft Research - Semantic Machines**, Berkeley, CA, USA, 05/2021 – 08/2021.
  Research Intern, Mentors: Charles Chen, Dr. Jacob Andreas, and Dr. Ben Van Durme.
  Research Focuses: HCI, NLP, AI-powered system.
  - **Computer Assisted Parsing**
    We investigated AI-powered techniques to facilitate the work of annotators and found that writing-assistance approaches can improve the annotation efficiency. [ACL Demo 2022]
- **Megagon Labs**, Mountain View, CA, USA, 06/2020 – 08/2020.
  Research Intern, Mentors: Dr. Jinfeng Li, Dr. Nikita Bhutani, Alexander Whedon, Dr. Yoshi Suhara, and Dr. Wang-Chiew Tan.
  Research Focuses: NLP, Deep Learning.

  - **Automatically Salient Facts Extraction**
    Although reading reviews is a valuable way to gather information, a huge portion of reviews are subjective, lengthy, and unhelpful. We defined "salient facts" as sentences that contain distinctive, objective, and non-generic information regarding an entity. We then introduce various approaches to extract these salient facts from a online reviews. [AIBSD 2022] [FEVER 2022]

- **Penn State University**, State College, PA, USA, 01/2019 – present.
  Research Assistant, Advisor: Dr. Ting-Hao K. Huang.
  Research Focuses: Crowdsourcing, NLP, Deep Learning, HCI, Writing Support System.

  - **InspiringPal: Inspiring Support for Creative Writing**
    InspiringPal is a creative writing support editor that offers four: (i) human inquiry, (ii) weak AI inquiry, (iii) GPT-3 inquiry, and (iv) GPT-3 completion, to help creative writers retrieve follow-up story ideas. We performed a deployment study and conduct interviews to examine the ways in which creative writers interact with InspiringPal. [Under Review]
  - **Conveying Explainable Writing Feedback through Conversational Agents**
    We aimed to develop a writing assessment system with multiple explanation mechanisms. Our results show that a conversational agent (chatbot) is a preferred mode for people to explore and manipulate model predictions. [CSCW Demo 2023]
  - **Scientific Figure Captioning as a Summarization Task**
    We showed that by summarizing the paragraphs mentioning the target figure, the caption figure quality can significantly improved. [INLG 2023] [EMNLP 2023 Finding]
  - **Conversational Voice Interface**
    The goal of this project was to gain an understanding of human perspectives toward conversational voice interfaces and prepare for future research in this area. [CHI LBW 2023]
  - **Conveying the Predicted Future to Users via Story Plot Prediction**
    We created a system that produces a short description that narrates possible futures to support novel writing in practice. [Creative AI 2023]
  - **Forthcoming Semantic Frame Prediction**
    We modeled long stories as sequences of story blocks, with each block represented as a fixed-length TF-IDF vector over semantic frames. The frame representation could capture information for stories exceeding 50 sentences while remaining human understandable. [NAACL 2021]
  - **Mathify: Equation Generation for Novice Researchers**
    This project aims to help novice writers or learners in writing equations to communicate their ideas by automatically generating them using the preceding paragraph as a reference.
  - **Heteroglossia: Modeling and Supporting Creative Writing**
    Heteroglossia allows creative writers to retrieve follow-up story ideas for their working draft. We stimulated crowd workers to generate ideas via a "role-playing" strategy. A deployment study suggested that Heteroglossia can help creative writers in various aspects. [CHI 2020]
  - **Visual Storytelling Post-Editing**
    We introduced the first dataset, VIST-Edit, which demonstrated that post-editing can enhance the story quality. Our findings also indicated the need for new auto-evaluation metrics as existing metrics exhibit low correlation with human judgments. [ACL 2019]
  - **Learner-Like Agent.**
    We hypothesize that learners will learn better when studying high-quality materials, while the opposite is true for poor materials. With this assumption, we developed a model simulating such a behavior and leverages it to automatically select good materials. [EMNLP 2020]
  - **SlowJimmy: Crowd-powered Voice Assistance.**
    We introduced SlowJimmy, a crowd-powered system embedded in Amazon Echo devices. Unlike previous text-based crowd-powered conversational systems, the unbalanced requirements

between workers (text) and users (voice) can lead to significant issues. In this study, we deployed SlowJimmy and examine potential problems that may arise. [HCOMP 2022 WiP/Demo]

  - **CaptionThis: Navigable Image Captioning.**
    We explored the potential for a "navigable" image captioning system that can enable visually impaired individuals to obtain a more comprehensive understanding of an image.

- **Arizona State University**, Tempe, AZ, USA, 05/2018 – 12/2018.
  Research Assistant, Advisor: Dr. Hanghang Tong.
  Research Focuses: Text Mining, Deep Learning.

  - **Geographic Information Prediction on Twitter**
    We proposed a model that incorporates the attention mechanism, subword features, and location hierarchy structure to predict the geographic information. [Frontiers in Big Data.]

- **Institute of Information Science, Academia Sinica**, Taipei, Taiwan, 04/2015 – 06/2017.
  Research Assistant, Advisor: Dr. Lun-Wei Ku.
  Research Focuses: Computer-Assisted Language Learning, Deep Learning, Computer-Mediated Communication, Emotion Detection, Sentiment Analysis.

  - **GiveMeExample: Learning Synonyms by Example Sentences**
    GiveMeExample aimed to provide language learners with essential example sentences that clarify confusion between synonyms. The system consists of three key components: a regression model for assessing sentence difficulty, a GMM and BiLSTM word-sentence fitness estimator, and a heuristic clarification scoring function. We deployed GiveMeExample to ESL learners and found it helpful. [BEA 2019] [WWW 2017] [COLING Demo 2016] [ASONAM Demo 2016]
  - **EmotionPush: Color-Based Emotion Cues for Messaging Applications**
    EmotionPush provided a machine-learning-powered system that automatically conveys users' emotions in messages by color-based emotion cues to bridge the limitation of text-based chatting system in expressing rich emotion. [AAAI Spring Symposia 2017]
  - **MoodSwipe: A Keyboard for Sentence Suggestion According to Emotions.**
    MoodSwipe can suggest text messages based on the user's specified emotion. Our goal was to create an interface that incorporates emotion classification and text suggestion technology, while simultaneously collecting labeled data automatically. [EMNLP Demo 2017]
  - **Response Time Prediction**
    This project aimed to predict the response time of a message sent on an instant messaging system, which can be viewed as a measure of the dialog generation system's effectiveness. [GLOBECOM 2018]

- **Communication & Multimedia Lab, National Taiwan University**, Taipei, Taiwan, 09/2013 – 06/2014.
  Undergraduate Intern Student, Advisor: Dr. Yung-Yu Chuang.
  Research Focuses: Digital Image Processing, Machine Learning.

  - **Light Field Image Multi-Label Assignment using Graph Cut.**
    We treated the light field image as a four-dimensional image and applied a modified four-dimensional graph cut algorithm for the multi-label assignment task.
  - **Shape-Preserving As-Projective-As-Possible (APAP) Image Stitching.**
    To address the APAP distortion issue, we introduced an energy function that incorporates a deformation term, a line preserving term, and an APAP term into the mesh warping algorithm.

- **Speech Processing Lab, National Taiwan University**, Taipei, Taiwan, 09/2012 – 06/2014.
  Undergraduate Intern Student, Advisor: Dr. Lin-Shan Lee.
  Research Focuses: Speech Processing, Machine Learning.

– **A Dialogue Game Framework with Personalized Training Using Reinforcement Learning.** This project aims to help language learners practice speaking through a dialogue game framework. A reinforcement learning agent is proposed to select the path of the dialogue tree in order to maximize the learning efficiency.

Papers

[P.24] Ting-Yao Hsu, **Chieh-Yang Huang**, Ryan Rossi, Sungchul Kim, Clyde Lee Giles, Ting-Hao K. Huang (2023). GPT-4 as an Effective Zero-Shot Evaluator for Scientific Figure Captions. To appear as a Finding in The 2023 Conference on Empirical Methods in Natural Language Processing (**EMNLP 2023 Findings**).

[P.23] **Chieh-Yang Huang** *, Ting-Yao Hsu*, Ryan Rossi, Ani Nenkova, Sungchul Kim, Gromit Yeuk-Yin Chan, Eunyee Koh, C Lee Giles, Ting-Hao K. Huang (2023). Summaries as Captions: Generating Figure Captions for Scientific Documents with Automated Text Summarization. In the Proceedings of the 16th International Natural Language Generation Conference (**INLG 2023**).
*Equal contribution
Best Long Paper Award, Top 3% (1 out of 26 accepted long papers)
Best Evaluation Paper Award Nomination, Top 10% (3 out of 26 accepted long papers)

[P.22] Shreya Chandrasekhar, **Chieh-Yang Huang**, Ting-Hao K. Huang (2023). Good Data, Large Data, or No Data? Comparing Three Approaches in Developing Research Aspect Classifiers for Biomedical Papers. In The 22nd Workshop on Biomedical Natural Language Processing and BioNLP Shared Tasks (**BioNLP 2023**).

[P.21] Hua Shen, **Chieh-Yang Huang**, Tongshuang Wu, Ting-Hao K. Huang (2023). ConvXAI: Delivering Heterogeneous AI Explanations via Conversations to Support Human-AI Scientific Writing. To appear in The 26th ACM Conference On Computer-Supported Cooperative Work And Social Computing, Demonstrations (**CSCW Demo 2023**).
Best Demo Award, Top 7% (1 out of 14 accepted demo papers)

[P.20] Shih-Hong Huang, **Chieh-Yang Huang**, Ya-Fang Lin, and Ting-Hao K. Huang (2023). What Types of Questions Require Conversation to Answer? A Case Study of AskReddit Questions. In the Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems. (**CHI LBW 2023**).

[P.19] **Chieh-Yang Huang**, Saniya Naphade, Kavya Laalasa Karanam, and Ting-Hao K. Huang (2023). Conveying the Predicted Future to Users: A Case Study of Story Plot Prediction. In the AAAI-23 Workshop on Creative AI Across Modalities (**Creative AI 2023**).

[P.18] Shih-Hong Huang, **Chieh-Yang Huang**, Yuxin Deng, Hua Shen, Szu-Chi Kuan, Ting-Hao K. Huang (2022). Too Slow to Be Useful? On Incorporating Humans in the Loop of Smart Speakers. The Works-in-Progress and Demonstration track of the 10th AAAI Conference on Human Computation and Crowdsourcing (**HCOMP 2022 WiP/Demo**).

[P.17] Anton Belyy*, **Chieh-Yang Huang** *, Jacob Andreas, Emmanouil Antonios Platanios, Sam Thomson, Richard Shin, Subhro Roy, Aleksandr Nisnevich, Charles Chen, Benjamin Van Durme (2022). Guided K-best Selection for Semantic Parsing Annotation. In the 60th Annual Meeting of the Association for Computational Linguistics - Demo Track (**ACL 2022 Demo**).
*Equal contribution

[P.16] **Chieh-Yang Huang**, Jinfeng Li, Nikita Bhutani, Alexander Whedon, Estevam Hruschka, Yoshihiko Suhara (2022). Extracting Salient Facts from Company Reviews with Scarce Labels. In the 5th instalment of the Fact Extraction and VERification FEVER 2022 (**FEVER 2022**) co-located with ACL 2022.

[P.15] Jinfeng Li, Nikita Bhutani, Alexander Whedon, **Chieh-Yang Huang**, Estevam Hruschka, Yoshihiko Suhara (2022). Extracting Salient Facts from Company Reviews with Scarce Labels. In the AAAI 2022 Workshop on Artificial Intelligence with Biased or Scarce Data (**AIBSD 2022**).

[P.14] **Chieh-Yang Huang** and Ting-Hao K. Huang (2021). Semantic Frame Forecasting. In the Proceedings of the 2021 Annual Conference of the North American Chapter of the Association for Computational Linguistics (**NAACL 2021**), 6 June - 11 June, 2021, Virtual Conference.

[P.13] Chacha Chen, **Chieh-Yang Huang**, Yaqi Hou, Yang Shi, Enyan Dai, Jiaqi Wang. (2020). TEST_POSITIVE at W-NUT 2020 Shared Task-3: Cross-task modeling. In Proceedings of the Sixth Workshop on Noisy User-generated Text (**W-NUT 2020**), 16 November - 20 November, Virtual Conference.

[P.12] Yun-Hsuan Jen, **Chieh-Yang Huang**, Mei-Hua Chen, Ting-Hao K. Huang, Lun-Wei Ku. (2020). Assessing the Helpfulness of Learning Materials with Inference-Based Learner-Like Agent. In Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (**EMNLP 2020**), 16 November - 20 November, Virtual Conference.

[P.11] Ting-Hao K. Huang, **Chieh-Yang Huang**, Chieh-Kuang Cornelia Ding, Yen-Chia Hsu, C Lee Giles. (2020). CODA-19: Reliably Annotating Research Aspects on 10,000+ CORD-19 Abstracts Using a Non-Expert Crowd. In Proceedings of the 1st Workshop on NLP for COVID-19 at ACL 2020, 5 July - 10 July, 2020, Virtual Conference.

[P.10] **Chieh-Yang Huang**, Shih-Hong Huang, and Ting-Hao K. Huang. (2020). Heteroglossia: In-Situ Story Ideation with the Crowd. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (**CHI 2020**), 25 April - 30 April, 2020, Honolulu, USA.

[P.9] **Chieh-Yang Huang**, Yi-Ting Huang, Mei-Hua Chen and Lun-Wei Ku. (2019). From Receptive to Productive: Learning to Use Confusing Words through Automatically Selected Example Sentences. In the 14th Workshop on Innovative Use of NLP for Building Educational Applications (**BEA 2019**), 28 July - 2 August, 2019, Florence, Italy.

[P.8] Ting-Yao Hsu, **Chieh-Yang Huang**, Yen-Chia Hsu, and Ting-Hao K. Huang. (2019). Visual Story Post-Editing. In Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics. (**ACL 2019**), 28 July - 2 August, 2019, Florence, Italy.

[P.7] **Chieh-Yang Huang**, Hanghang Tong, Jingrui He, and Ross Maciejewski. (2019). Location Prediction for Tweets. Frontiers in Big Data.

[P.6] **Chieh-Yang Huang** and Lun-Wei Ku. (2018). EmotionPush: Emotion and Response Time Prediction towards Human-like Chatbots. In Proceedings of the 2018 of the IEEE Global Communications Conference (**GLOBECOM 2018**), 9-13 December, 2018, Abu Dhabi, UAE.

[P.5] **Chieh-Yang Huang**, Tristan Labetoulle, Ting-Hao K. Huang, Yi-Pei Chen, Hung-Chen Chen, Vallari Srivastava, and Lun-Wei Ku. (2017). 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**), 7–11 September, 2017, Copenhagen, Denmark.

[P.4] **Chieh-Yang Huang**, Mei-Hua, and Lun-Wei Ku (2018). Towards a Better Learning of Near-Synonyms: Automatically Suggesting Example Sentences via Filling in the Blank. In Proceedings of the 26th International Conference on World Wide Web Companion. (**WWW 2017**), 3-7 April, 2017, Perth, Australia.

[P.3] **Chieh-Yang Huang**, Ting-Hao K. Huang, and 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)**, 27-29 March, 2017, Palo Alto, USA.

[P.2] **Chieh-Yang Huang**, Nicole Peinelt, and Lun-Wei Ku. (2016). Automatically Suggesting Example Sentences of Near-Synonyms for Language Learners. In Proceedings of COLING 2016, the 26th International Conference on Computational Linguistics: System Demonstrations. (**COLING Demo 2016**), 13-16 December, 2016, Osaka, Japan.

[P.1] **Chieh-Yang Huang** and Lun-Wei Ku. (2016). GiveMeExample: Learning confusing words by example sentences. In the Demo Track of the Proceedings of the 2016 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining. (**ASONAM Demo 2016**), 18-21 August, 2016, San Francisco, USA.

Activity and Leadership Experience

- **Director, Senior Yearbook Editor**
  Dept. Electrical Engineering, Taipei, Taiwan, 09/2013 – 06/2014
  - Familiar with Photoshop, Illustrator, and graphic design skills.
  - Leaded a team of ten people to edit the yearbook.
- **Director, Department of Art and Design**
  Electrical Engineering Student Association, Taipei, Taiwan, 09/2012 – 06/2013
  - Leaded a ten-person team to do graphic design and build installed artworks.
  - Supported activities such as Electrical Engineering Night, Christmas Prom, Freshmen Orientation Camp, Electrical Engineering Camp and so on.

Service and Teaching

- **Teaching Assistant**:
  - IST 402 - Crowdsourcing & Crowd-AI Systems (Spring 2020, Spring 2023)
  - IST 261 - Application Development Design Studio I (Spring 2022)
  - DS 440 - Capstone (Spring 2021, Fall 2021)
- **Reviewer**: CHI 2024, ACL 2023, CHI LBW 2023, CreativeAI workshop 2023, EACL 2023, EMNLP 2022, ACL Rolling Review, In2Writing Workshop 2022, UIST 2022, AAAI 2022, EMNLP 2021, ACL 2021, NAACL 2021, AAAI 2021, CHI LBW 2021, WNUT 2020

References

- **Lun-Wei Ku**
  Associate Research Fellow, Institute of Information Science, Academia Sinica, Taiwan.
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- **Ting-Hao K. Huang**
  Tenure-Track Assistant Professor, College of Information Sciences and Technology, Pennsylvania State University, USA
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