# Ting-Yao (Edward) Hsu

txh357@psu.edu • https://tingyaohsu.github.io • Google Scholar

## Research Interests

My research interests lie in vision-language models (VLMs) and large language models (LLMs) for a wide range of downstream applications, with a particular emphasis on improving text generation, refining evaluation methodologies, and exploring post-training techniques. I am also dedicated to developing LLM-based agents that are aligned with human preferences.

## Education

**Ph.D. in Computer Science**
Pennsylvania State University, PA, USA *2020.08-2024.12(Expected)*
Co-Advisors: Dr. C. Lee Giles, Dr. Ting-Hao K. Huang
Research Topics: Multimodal learning, Story & Figure captioning generation, Human-AI Collaboration.

**M.S. in Computer Science**
Pennsylvania State University, PA, USA *2017.08-2019.12*
Co-Advisors: Dr. C. Lee Giles, Dr. Ting-Hao K. Huang
Thesis: Automated Visual Storytelling Post-editing

**B.S. in Computer Science**
National Tsing Hua University, Hsinchu, Taiwan. *2012.09-2016.06*

## Publications

### Peer-Reviewed Conference Papers

**[C.7] Ting-Yao Hsu**, Chieh-Yang Huang, Shih-Hong Huang, Ryan Rossi, Sungchul Kim, Tong Yu, C. Lee Giles, Ting-Hao K. Huang. SciCapenter: Supporting Caption Composition for Scientific Figures with Machine-Generated Captions and Ratings. In CHI'24 Late-Breaking Work on Human Factors in Computing Systems (CHI Late-Breaking-Work 2024).

**[C.6] Ting-Yao Hsu**, Chieh-Yang Huang, Ryan Rossi, Sungchul Kim, C. Lee Giles, Ting-Hao K. Huang. GPT-4 as an Effective Zero-Shot Evaluator for Scientific Figure Captions. In Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP 2023 Findings).

**[C.5] Ting-Yao Hsu***, Chieh-Yang Huang*, Ryan Rossi, Ani Nenkova, Sungchul Kim, Gromit Yeuk-Yin Chan, Eunyee Koh, C. Lee Giles, Ting-Hao K. Huang. Summaries as Captions: Generating Figure Captions for Scientific Documents with Automated Text Summarization. (INLG 2023) Best Paper Award (1/26 = 3.8%).

**[C.4] Ting-Yao Hsu**, Yoshi Suhara, Xiaolan Wang. Summarizing Community-based Question-Answer Pairs. In Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP 2022).

**[C.3] Ting-Yao Hsu**, C. Lee Giles, Ting-Hao K. Huang. SciCap: Generating Captions for Scientific Figures. Findings of the 2021 Conference on Empirical Methods in Natural Language Processing (EMNLP 2021 Findings). Poster Presentation at the 7th Workshop on Noisy User-generated Text (W-NUT 2021, together with EMNLP 2021).

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

**[C.1] Ting-Yao Hsu**, Yen-Chia Hsu, Ting-Hao K. Huang. On How Users Edit Computer-Generated Visual Stories. In CHI'19 Late-Breaking Work on Human Factors in Computing Systems (CHI Late-Breaking- Work 2019).

## Research Experience and Projects

**Amazon** **Palo Alto, CA, USA**
Applied Scientist Intern, Mentor: Dakuo Wang, Hansu Gu, Limeng Cui *2024.05-2024.10*
Research Focuses: LLM-based Agents and HCI.

- **LLM-based agents**
  Conducted in-depth research and development in the areas of planning, reasoning, and decision-making processes for LLM-based agents.

**NEC Laboratories America, Inc** **Princeton, NJ, USA**
Research Intern, Mentor: Yuncong Chen *2022.05-2022.08*
Research Focuses: Data Mining, Time-Series, NLP.

- **Data-Efficient TimeSeries-to-Text Generation**
  Purpose a Time-Series-to-Text framework serves two primary functions: (1) enhancing language generation by incorporating concept labels as conditioning factors and (2) harnessing the existing knowledge from pre-trained language models. Our framework demonstrates the capability to automatically generate coherent descriptions, even in data-scarce scenarios, and provides diverse descriptions for time series data.

**Megagon Labs** **Mountain View, CA, USA**
Research Intern, Mentors: Yoshihiko Suhara, Xiaolan Wang *2021.06-2021.08*
Research Focuses: Summarization, Community QA, NLP.

- **Community Question Answering (CQA) Summarization**
  CQA is important for online services such as e-commerce, but the large number of data makes it difficult to find useful information. We propose CQA summarization task, design a multi-stage data annotation process and create a benchmark dataset. We then compare existing extractive/abstractive summarization methods and establish a strong baseline approach DedupLED for the task. The experimental results show that our method have promising ability to do sentence-type transfer and deduplication removal. **[EMNLP 2022]**

**Pennsylvania State University** **State College, PA, USA**
Research Assistant, Advisors: Dr. C. Lee Giles, Dr. Ting-Hao K. Huang *2018.07-Present*
Research Focuses: CV, NLP, Deep Learning, HCI, Accessibily.

- **Visual Story Post-Editing**
  Editing plays an important role for humans. Needless to say, machines need post-editing. In this task, we introduce the first Visual Story Telling Post-Editing dataset, VIST-Edit, and show that post-editing can improve the story quality. The result also suggests that new auto evaluation metrics are needed due to the low correlation between the human judgments and the existing autometrics. **[ACL 2019]**

- **CaptionThis**
  Image captioning system can only be applied on the whole image to generate the overview information. CaptionThis aims at exploring the uncertainty and sensitivity of an interactive image captioning system, which may help visually impaired people have a better understanding of the image by four different gestures.

- **Detecting Self-Reported Memory Problems in Transcripts of Interviews with Older Adults**
  "Self-reported memory problems" via structured interviews, and manually coding the transcripts can improve preclinical Alzheimer's disease detection, but laborious and time-consuming. We present the first exploration in automatically identifying self-reported memory problems in interview transcripts and develop a stacking ensemble model that achieves an average sentence-level F1-score of 77.3% and an average accuracy of 77.7% in the detection task.

**National Tsing Hua University** **Hsinchu, Taiwan**
Research Assistant, Advisor: Dr. Shang-Hong Lai *2017.04-2017.08*

Research Focuses: CV, Deep Learning.

- **Accurate and robust 3D face recognition from RGB-D images**
  Face recognition can use two types of image data (colour and depth images) from RGB-D images to achieve more accurate recognition. In this projects, we develop 3D face recognition system using RGB-D image data from Kinect to facilitate identification accuracy for existing system. A novel deep convolutional neural network (DCNN) is proposed to align various head poses and identify both color and depth face images based on existing algorithm. We further explore variations in head rotation and environmental illumination for 3D face recognition.

## Service

**Committee Member:** ACL Rolling'22, EMNLP'22 (NLP Application Track)
**Conference Reviewer:** KDD'22, UIST'21

## Teaching Assistant Experience

**Pennsylvania State University**

- **Database Management Systems** (CMPSC431) (Undergraduate, 190 students) *Spring'22*
- **ML and Algorithmic AI** (CMPSC448) (Undergraduate, 80 students) *Fall'21, Spring'23*
- **Computational Theory** (CMPSC464) (Undergraduate, 150 students) *Spring'19*
- **Pattern Recognition and AI** (CSE543) (Graduate, 50 students) *Spring'18*
- **Artificial Intelligence** (CMPSC442) (Undergraduate, 60 students) *Fall'18, Fall'19*

## Technical Skills

| | |
|---|---|
| **DL/ML Programming** | PyTorch, PyTorch-Lightning, TensorFlow, Keras, Scikit-Learn |
| **Web and Visualization** | Matplotlib, HTML/CSS, JS, JQuery, Flask, React.js |
| **Operational Systems** | Linux/Unix, Shell Script, MacOS, Windows |
| **Database** | MySQL, MongoDB, SQLite |
| **Miscellaneous** | Amazon MTurk, UpWork, AWS, GCP, Kinect |

## References

**Ting-Hao K. Huang**
Assistant Professor, College of Information Sciences and Technology, Pennsylvania State University.
txh710@psu.edu

**C. Lee Giles.**
David Reese Professor, College of Information Sciences and Technology & College of Engineering of Computer Science and Engineering, Pennsylvania State University.
giles@ist.psu.edu