Chi-Yang (Ethan) Hsu

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RESEARCH INTEREST

I specialize in NLP and trustworthy AI, focusing on confidence estimation and uncertainty quantification for large language models. I develop confidence estimation techniques for free-form generation and explore their applications in multi-agent systems, aiming to make AI uncertainty more calibrated and actionable

EDUCATION

PhD in Information Studies

University of Texas at Austin • Austin, TX • Present

Master of Science in Information Sciences and Technology

Penn State University • State College, PA • 2021

Bachelor of Science in Information Sciences and Technology

Penn State University • State College, PA • 2019

EXPERIENCE

NLP Research Assistant

University of Texas at Austin **May 2024 - Present, Austin, TX, US**

AI&HCC Lab, supervised by Professor Matthew Lease

- Designed a supervised calibration framework for free-form LLM generation, reformulating quality prediction as interval estimation, achieving calibration error <0.1 across summarization and code-generation benchmarks.

NLP Research Assistant

University of Texas at Austin **August 2023 - May 2024, Austin, TX, US**

AI Health Lab, supervised by Professor Ying Ding

- Developed LLM-driven bioinformatics frameworks to perform gene set analysis and biological process reasoning.
- Implemented agentic workflows to assess accuracy, specificity, and uncertainty in scientific text generation.

NLP Research Intern

University of Washington **July 2021 - June 2022, WA, US**

Behavioral Data Science Group, supervised by Professor Tim Althoff

- Implemented transformer-based ML methods to predict PHQ-9 scores from virtual therapy conversations.
- Analyzed linguistic features between clients and therapists to interpret score changes and improve mental health outcomes.

Research Assistant

Penn State University **August 2019 - June 2021, PA, US**

Crowd-AI Lab, supervised by Professor Ting-Hao (Kenneth) Huang

- Built and evaluated image-to-text VLM frameworks for visual storytelling.
- Conducted large-scale social media analysis using NLP techniques to assess essential workers' mental well-being during the COVID-19 pandemic.

NLP Research Assistant

Academia Sinica **May 2019 - June 2021, Taiwan**

NLPSA Lab, The National Academy of Taiwan, supervised by Dr. Lun-Wei Ku

- Researched in visual storytelling by designing Knowledge Graph-integrated Vision-Language Model (VLM) frameworks.
- Developed novel LM-based evaluation metrics for generated stories that achieved high alignment with human judgment.

PUBLICATIONS

PIE: Performance Interval Estimation for Free-Form Generation Tasks
Chi-Yang Hsu, Alex Braylan, Yiheng Su, Omar Alonso, Matthew Lease • ArXiv 2025

Mapping from Meaning: Addressing the Miscalibration of Prompt-Sensitive Language Models
Kyle Cox, Jiawei Xu, Yikun Han, Rong Xu, Tianhao Li, Chi-Yang Hsu, Tianlong Chen, Walter Gerych, Ying Ding • AAAI 2025 Long

Thought Graph: Balancing Specificity and Uncertainty in LLM-Based Gene Set Annotation
Kyle Cox, Gang Qu, Chi-Yang Hsu, Jiawei Xu, Yingtong Zhou, Zhen Tan, Mengzhou Hu, Tianlong Chen, Ziniu Hu, Zhongming Zhao, Ying Ding • IEEE ICHI 2025

Thought Graph: Generating Thought Process for Biological Reasoning
Chi-Yang Hsu, Kyle Cox, Jiawei Xu, Zhen Tan, Tianhua Zhai, Mengzhou Hu, Dexter Pratt, Tianlong Chen, Ziniu Hu, Ying Ding • WebConf Short 2024

Learning to Rank Visual Stories From Human Ranking Data
Chi-Yang Hsu, Yun-Wei Chu, Vincent Chen, Kuan-Chieh Lo, Chacha Chen, Ting- Hao K. Huang, Lun-Wei Ku • ACL Long 2022

Plot and Rework: Modeling Storylines for Visual Storytelling
Chi-Yang Hsu, Yun-Wei Chu, Ting-Hao K. Huang, Lun-Wei Ku • ACL-IJCNLP Findings 2021

Stretch-VST: Getting Flexible With Visual Stories
Chi-Yang Hsu, Yun-Wei Chu, Tsai-Lun Yang, Ting-Hao (Kenneth) Huang, Lun-Wei Ku • ACL-IJCNLP Demo 2021

Using Tweets to Assess Mental Well-being of Essential Workers During the COVID-19 Pandemic
Johnna Blair, Chi-Yang Hsu, Ling Qiu, Shih-Hong Huang, Ting-Hao (Kenneth) Huang, Saeed Abdullah • CHI LBW 2021

Let's Talk! Striking Up Conversations via Conversational Visual Question Generation
Shih-Han Chan, Tsai-Lun Yang, Yun-Wei Chu, Chi-Yang Hsu, Ting-Hao Huang, Yu- Shian Chiu, Lun-Wei Ku • AAAI 2021 Workshop Deep-Dial

Knowledge-Enriched Visual Storytelling
Chao-Chun Hsu, Zi-Yuan Chen, Chi-Yang Hsu, Chih-Chia Li, Tzu-Yuan Lin, Ting- Hao (Kenneth) Huang, Lun-Wei Ku • AAAI Long 2020

Ameliorating Farmer Suicides by Predicting Crop Price Trends using a Deep Learning Approach
Maryam Tabar, Chi-Yang Hsu, Hangzhi Guo, Amirreza Bagherzadehkhorasani, Amulya Yadav • ECAI Workshop - AI4EQ 2020

Navigating Ride-Sharing Regulations: How Regulations Changed the 'Gig' of Ride-Sharing for Drivers in Taiwan
Anita Chen, Chien-Wen Yuan, Ning F. Ma, Chi-Yang Hsu, Benjamin V. Hanrahan • CHI Long 2019

SKILLS

Research Areas: Uncertainty Quantification, Quality Estimation, Confidence Estimation for Long-Form Generation, Conformal Prediction (CRC, CQR), LLM Routing & Cascading, Cost-Quality Optimization, LLM Evaluation, Visual Language Model, Visual Storytelling, NLP for Mental Health, NLP for Biomedical.

ML / NLP Methods: Transformer Fine-tuning (DeBERTa, BERT), Regression & Quantile Regression, Calibration, Monte Carlo Dropout, LLM-as-a-Judge, Knowledge Graphs.

LLMs & GenAI: Prompt Engineering, AI Agents, LLM Routing, Benchmarking, Tool Use & Function Calling.

Languages & Frameworks: Python, PyTorch, Hugging Face Transformers, scikit-learn, NumPy, pandas, Matplotlib

Cloud & Infrastructure: AWS (Bedrock), Google Cloud Platform, HPC/SLURM (TACC), Conda, Linux, Git