# Yung-Sung Chuang

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## RESEARCH INTERESTS

- **Multimodal & Pre-training**: scaling CLIP pre-training to multilingual/worldwide web data (MetaCLIP 2) [*arXiv'25*]
- **LLM Alignment & Factuality**: self-supervised alignment (SelfCite) [*ICML'25*], decoding strategies for factuality (DoLa) [*ICLR'24*], hallucination detection (Lookback Lens) [*EMNLP'24*]
- **Retrieval**: retrieval-augmented LLMs (SAIL) [*EMNLP'23*], query reranking [*ACL'23*], sentence embeddings (DiffCSE) [*NAACL'22*]
- **Reinforcement Learning for VLMs**: RL for text-image interleaved reasoning (Meta FAIR internship, ongoing)

## Education

**Massachusetts Institute of Technology (MIT)**                                        *Sep. 2021 - PRESENT*
PH.D. CANDIDATE IN COMPUTER SCIENCE
- **GPA: 5.0/5.0** (up-to-date)
- Computer Science & Artificial Intelligence Laboratory (CSAIL), Advisor: Dr. James Glass

**National Taiwan University (NTU)**                                        *Sep. 2016 - Jun. 2020*
B.S. IN ELECTRICAL ENGINEERING
- **GPA:** overall: **4.18/4.30**, major: **4.22/4.30**
- **Honors:** Presidential Award * 4 (S '18, S '19, F '19, S '20), Irving T. Ho Memorial Scholarship (F '18, F '19)

## Research Experiences

**Meta FAIR, Seattle** *Advisor: Luke Zettlemoyer*                                        *May 2025 – Present*
RESEARCH SCIENTIST INTERN
- Designing **reinforcement learning** methods for visual reasoning in multimodal LLMs, enabling better **text-image interleaved reasoning** (ongoing project).

**Meta FAIR, Seattle** *Advisors: Hu Xu, Shang-Wen (Daniel) Li, and Wen-tau (Scott) Yih*                                        *May 2024 – Jan. 2025*
RESEARCH SCIENTIST INTERN
- Pre-trained **MetaCLIP 2** [*arXiv'25*], a large-scale CLIP (ViT-H/14), by building worldwide **data curation** pipeline from scratch, beating **SoTA on multilingual tasks** by around 5%, with around 1% **boost on English tasks**, breaking the *"curse of multilinguality"*.
- Proposed **SelfCite** [*ICML'25*], a **self-supervised alignment** method for generating **accurate citations**, with up to 5.3% boost.

**Microsoft, Redmond** *Advisor: Pengcheng He*                                        *Jun. 2023 – Sep. 2023*
RESEARCH SCIENTIST INTERN
- Developed **DoLa** [*ICLR'24*], a decoding strategy improving **factual accuracy** in LLM outputs by 12-17%, integrated into Hugging-Face Transformers library as one of the generation strategies [*HF Transformers Docs*].

**Spoken Language Systems Group, CSAIL, MIT** *Advisor: James Glass*                                        *Sep. 2021 – Present*
RESEARCH ASSISTANT
- Led multiple projects on **factuality and hallucinations in LLMs**: SelfCite [*ICML'25*], DoLa [*ICLR'24*], Lookback Lens [*EMNLP'24*].
- Developed **retrieval-based** and **sentence embeddings** methods: SAIL [*EMNLP'23*], *Query Reranking* [*ACL'23*], *DiffCSE* [*NAACL'22*].
- Published **5 first-author papers** at top conferences.

**National Taiwan University** *Advisors: Hung-yi Lee, Yun-Nung (Vivian) Chen, and Lin-shan Lee*                                        *2018 – 2021*
UNDERGRADUATE RESEARCHER
- Built benchmarks and models for **speech representation learning**, **speech-to-text translation (ST)**, and **spoken language understanding (SLU)**: *SUPERB* benchmark [*Interspeech'21*], non-autoregressive ST [*ACL'21*], and SLU without ASR [*ICASSP'21*].
- Improved **continual learning** with GPT-2 and explored **NLU/NLG duality**: *L2KD* [*EMNLP'20*], and *dual inference* [*EMNLP'20*].
- Developed *SpeechBERT* [*Interspeech'20*], a joint speech–text pretrained model for spoken QA.

## Selected Publications ($^\dagger$ indicates equal contribution.)

[1]   **Yung-Sung Chuang**, Yang Li, Dong Wang, Ching-Feng Yeh, Kehan Lyu, Ramya Raghavendra, James Glass, Lifei Huang, Jason Weston, Luke Zettlemoyer, Xinlei Chen, Zhuang Liu, Saining Xie, Wen-tau Yih, Shang-Wen Li, Hu Xu. "MetaCLIP 2: A Worldwide Scaling Recipe". *arXiv 2025 (under review)*.

[2]   **Yung-Sung Chuang**, Benjamin Cohen-Wang, Shannon Shen, Zhaofeng Wu, Hu Xu, Xi Victoria Lin, James Glass, Shang-Wen Li, Wen-tau Yih. "SelfCite: Self-Supervised Alignment for Context Attribution in Large Language Models". *In ICML 2025*.

[3]   **Yung-Sung Chuang**, Linlu Qiu, Cheng-Yu Hsieh, Ranjay Krishna, Yoon Kim, James Glass. "Lookback Lens: Detecting and Mitigating Contextual Hallucinations in Large Language Models Using Only Attention Maps". *In EMNLP 2024*.

[4]    **Yung-Sung Chuang**, Yujia Xie, Hongyin Luo, Yoon Kim, James Glass, Pengcheng He. "DoLa: Decoding by Contrasting Layers Improves Factuality in Large Language Models". *In ICLR 2024*.

[5]    Hongyin Luo, **Yung-Sung Chuang**, Yuan Gong, Tianhua Zhang, Yoon Kim, Xixin Wu, Danny Fox, Helen Meng, James Glass. "SAIL: Search-Augmented Instruction Learning". *In EMNLP 2023*.

[6]    **Yung-Sung Chuang**, Wei Fang, Shang-Wen Li, Wen-tau Yih, James Glass. "Expand, Rerank, and Retrieve: Query Reranking for Open-Domain Question Answering". *In ACL 2023*.

[7]    **Yung-Sung Chuang**, Rumen Dangovski, Hongyin Luo, Yang Zhang, Shiyu Chang, Marin Soljačić, Shang-Wen Li, Wen-tau Yih, Yoon Kim, James Glass. "DiffCSE: Difference-based Contrastive Learning for Sentence Embeddings". *In NAACL 2022*.

[8]    Shu-wen Yang, Po-Han Chi[†], **Yung-Sung Chuang**[†], Cheng-I Jeff Lai[†], Kushal Lakhotia[†], Yist Y. Lin[†], Andy T. Liu[†], Jiatong Shi[†], Xuankai Chang, Guan-Ting Lin, Tzu-Hsien Huang, Wei-Cheng Tseng, Ko-tik Lee, Da-Rong Liu, Zili Huang, Shuyan Dong, Shang-Wen Li, Shinji Watanabe, Abdelrahman Mohamed, Hung-Yi Lee. "SUPERB: Speech processing Universal PERformance Benchmark". *In Interspeech 2021*.

[9]    **Yung-Sung Chuang**, Shang-Yu Su, Yun-Nung Chen. "Lifelong Language Knowledge Distillation". *In EMNLP 2020*.

[10]   **Yung-Sung Chuang**[†], Shang-Yu Su[†], Yun-Nung Chen. "Dual Inference for Improving Language Understanding and Generation". *In EMNLP 2020*.

[11]   **Yung-Sung Chuang**, Chi-Liang Liu, Hung-Yi Lee, Lin-shan Lee. "SpeechBERT: An Audio-and-text Jointly Learned Language Model for End-to-end Spoken Question Answering". *In Interspeech 2020*.

## Teachings & Talks

**Speaker** at Embodied Intelligence Seminar 2025, MIT CSAIL                          *Apr. 2025*
- Topic: Reducing Hallucinations in LLMs via Decoding, Detection, and Citation. [*YouTube Link*]

**Teaching Assistant** on Natural Language Processing 2023 Fall @ MIT          *Sep. 2023 - Dec. 2023*
- Worked with Prof. Jacob Andreas, Yoon Kim, and Chris Tanner. [*Course Website*]

**Tutorial Speaker** at AACL-IJCNLP 2022                                      *Nov. 2022*
- Co-hosted a tutorial: **Recent Advances in Pre-trained Language Models: Why Do They Work and How to Use Them** with Prof. Hung-yi Lee and Cheng-Han Chiang at AACL-IJCNLP 2022. [*Slide Link*] [*YouTube Link*]
- Introduced the topic of **Contrastive Learning for Pre-trained Language Models**.

## Honors & Awards

**Reviewers,** NeurIPS (2021, 2022, 2023, 2024, 2025), ICLR (2021, 2022, 2023, 2024, 2025), ICML (2022, 2023, 2024. 2025), AAAI (2023), EMNLP (2022, 2023), ICASSP (2021, 2022, 2023), Interspeech (2021)          *Apr. 2021 - PRESENT*

**Presidential Award - for top 5% students (4 times),** Electrical Engineering Dept. at NTU          *Spring '18, Spring '19, Fall '19, Spring '20*

**Irving T. Ho Memorial Scholarship (2 times),** EECS at NTU          *Fall '18, Fall '19*

## Skills

**Languages**    Python, C++, Go, MATLAB, Shell Scripting

**Libraries&Toolkits**    PyTorch, Huggingface Transformers, MetaCLIP, TRL, VeRL, DeepSpeed, Ray, Slurm