Yi-Lin Sung

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Education

- **The University of North Carolina at Chapel Hill (UNC)** — Chapel Hill, NC
  PhD student in Computer Science (CS) — *Jan. 2021 – May 2025 (expected)*
  - Researched multimodal deep learning under the supervision of Mohit Bansal in the MURGe lab.
- **National Taiwan University** — Taipei, Taiwan
  Master of Science in Graduate Institute of Communication Engineering (GICE) — *Sep. 2017 – June 2019*
  - Thesis: Difference-Seeking Generative Adversarial Network – Unseen Data Generation. Advisor: Soo-Chang Pei
- **National Taiwan University** — Taipei, Taiwan
  Bachelor of Science in Chemical Engineering (CHE) — *Sep. 2012 – Jan. 2017*

Selected Publications

- **Yi-Lin Sung**, Prateek Yadav, Jialu Li, Jaehong Yoon, Mohit Bansal, "RSQ: Learning from Important Tokens Leads to Better Quantized LLMs", *arXiv:2503.01820*. [paper]
- Pingzhi Li, Prateek Yadav, Jaehong Yoon, Jie Peng, **Yi-Lin Sung**, Mohit Bansal, Tianlong Chen, "Glider: Global and Local Instruction-Driven Expert Router", *arXiv:2410.07172*. [paper]
- Vaidehi Patil, **Yi-Lin Sung**, Peter Hase, Jie Peng, Tianlong Chen, Mohit Bansal, "Unlearning Sensitive Information in Multimodal LLMs: Benchmark and Attack-Defense Evaluation", *Transactions on Machine Learning Research (TMLR)*, 2024.
- Feng Cheng, Ziyang Wang, **Yi-Lin Sung**, Yan-Bo Lin, Mohit Bansal, Gedas Bertasius, "DAM: Dynamic Adapter Merging for Continual Video QA Learning", Winter Conference on Applications of Computer Vision (WACV), 2025. [paper]
- Jialu Li, Jaemin Cho, **Yi-Lin Sung**, Jaehong Yoon, Mohit Bansal, "SELMA: Learning and Merging Skill-Specific Text-to-Image Experts with Auto-Generated Data", *Neural Information Processing Systems (NeurIPS)*, 2024.[paper]
- **Yi-Lin Sung**, Jaehong Yoon, Mohit Bansal, "ECoFLaP: Efficient Coarse-to-Fine Layer-Wise Pruning for Vision-Language Models", *International Conference on Learning Representations (ICLR)*, 2024.[paper]
- Pingzhi Li, Zhenyu Zhang, Prateek Yadav, **Yi-Lin Sung**, Yu Cheng, Mohit Bansal, Tianlong Chen "Merge, Then Compress: Demystify Efficient SMoE with Hints from Its Routing Policy", *International Conference on Learning Representations (ICLR)*, 2024. [paper]
- Ziyang Wang, **Yi-Lin Sung**, Feng Cheng, Gedas Bertasius, Mohit Bansal, "Unified Coarse-to-Fine Alignment for Video-text Retrieval", *International Conference on Computer Vision (ICCV)*, 2023. [paper]
- **Yi-Lin Sung**, Linjie Li, Kevin Lin, Zhe Gan, Mohit Bansal, Lijuan Wang, "An Empirical Study of Multimodal Model Merging", *Empirical Methods in Natural Language Processing (EMNLP) Findings*, 2023. [paper]
- Yan-Bo Lin, **Yi-Lin Sung**, Jie Lei, Mohit Bansal, Gedas Bertasius, "Vision Transformers are Parameter-Efficient Audio-Visual Learners", *Computer Vision and Pattern Recognition Conference (CVPR)*, 2023. [paper]
- **Yi-Lin Sung**, Jaemin Cho, Mohit Bansal, "LST: Ladder Side-Tuning for Parameter and Memory Efficient Transfer Learning", *Neural Information Processing Systems (NeurIPS)*, 2022. [paper]
- **Yi-Lin Sung**, Jaemin Cho, Mohit Bansal, "VL-Adapter: Parameter-Efficient Transfer Learning for Vision-and-Language Tasks", *Computer Vision and Pattern Recognition Conference (CVPR)*, 2022 [paper]
- **Yi-Lin Sung***, Varun Nair*, Colin Raffel, "Training Neural Networks with Fixed Sparse Masks". *Neural Information Processing Systems (NeurIPS)*, 2021. [paper]
- **Yi-Lin Sung**, Sung-Hsien Hsieh, Soo-Chang Pei, Chun-Shien Lu, "Difference-Seeking Generative Adversarial Network – Unseen Data Generation". *International Conference on Learning Representations (ICLR)*, 2020. [paper]
- **Yi-Lin Sung***, Jun-Liang Lin*, Cheng-Yao Hong*, Tyng-Luh Liu, "The Maximum A Posteriori Estimation of DARTS". *IEEE International Conference on Image Processing (ICIP)*, 2021. [paper]
- **Yi-Lin Sung**, Cheng-Yao Hong, Yen-Chi Hsu, Tyng-Luh Liu, "Video Summarization with Anchors and Multi-Head Attention". *IEEE International Conference on Image Processing (ICIP)*, 2020. [paper]
- **Yi-Lin Sung**, "Tetris Battle – A New Environment for Single-mode and Double-Mode Game". *Neural Information Processing Systems (NeurIPS) Workshop on Deep Reinforcement Learning*, 2019. [paper]

Research Experience

- **UNC Multimodal Understanding, Reasoning, and Generation for Language Lab** — Chapel Hill, NC
  Graduate Research Assistant. Advisor: Dr. Mohit Bansal — *Aug. 2021 – Present*
  - Research the topic of multi-modal learning.
- **UNC Biomedical Image Analysis Group (UNC-biag)** — Chapel Hill, NC
  Intern. Advisor: Dr. Marc Niethammer — *May 2021 – Aug. 2021*
  - Maintained and revitalized the dated pediatric airway analysis tool.
  - Added an open-source segmentation tool (easyreg) to the project to enable the automatically airway segmentation.
  - Built a two-stage landmark detector to process the extremely large 3D inputs, and it outperformed the baseline by 36%.
- **Institute of Information Science, Academia Sinica** — Taipei, Taiwan
  Part-time (Sep. 2018 – Dec. 2019) and full-time research assistant. Advisor: Dr. Tyng-Luh Liu — *Sep. 2018 – Mar. 2020*
  - Researched and submitted the work about improving Differentiable Architecture Search (DARTS) with learnable prior.
  - Researched and submitted the work about video summarization with anchors and attention.
  - Utilized oversampling and sample-reweighting techniques to handle the imbalance issues in the LVIS challenge.
- **Institute of Information Science, Academia Sinica** — Taipei, Taiwan
  Research intern. Advisor: Dr. Tyng-Luh Liu — *July. 2018 – Aug. 2018*
  - Researched the topic of video summarization and implemented the whole pipeline for training a summarizer.

Industry Experience

- **Google** — Mountain View
  Research intern working with Otilia Stretcu, Chun-Ta Lu and Alan Luo — *May 2024 – Aug. 2024*
  - Research the topic of VLM critic and VLM self-refinement.
- **Meta** — Menlo Park
  Research intern working with Abhimanyu Dubey, Filip Radenovic and Abhishek Kadian — *May 2023 – Aug. 2023*
  - Research the topic of text-to-image diffusion models.
- **Microsoft** — Remote
  Summer Research intern working with Linjie Li, Zhe Gan and Kevin Lin — *May 2022 – Aug. 2022*
  - Research the topic of multimodal model merging.
- **Cinnamon AI Taiwan** — Taipei, Taiwan
  AI researcher — *Mar. 2020 – Jan. 2021*
  - Accelerated the company's main models by 25% without sacrificing the accuracy by using model quantization and distillation.
  - Built a classifier with attention that achieves 98% accuracy, which surpasses the expectation by 13%, in a client project.
  - Led and taught NLP classes in the Bootcamp to nurture AI talents in Taiwan.

Teaching Experience

- **Deep Learning @ UNC Chapel Hill** — Chapel Hill, NC
  Teaching Assistant. Instructor: Dr. Colin Raffel — *Jan. 2021 – May 2021*
  - Prepared the answers for homework and tests and graded them.
- **Natural Language Processing @ Cinnamon AI Bootcamp** — Taipei, Taiwan
  Instructor — *June 2020 – Aug. 2020*
  - Gave lectures about the latest NLP pre-trained models and using PyTorch for NLP.
- **Machine Learning and Having It Deep and Structured @ National Taiwan University** — GICE, NTU
  Teaching Assistant. Instructor: Dr. Hung-Yi Lee — *Jan. 2018 – Jun. 2018*
  - Responsible for the first homework: Validating the Theories of Neural Network through Experiments.

Projects Highlights

- **PyTorch Lightning Semi-Supervised Learning**
  A project to implement state-of-the-art algorithms with standardized framework
  - Reproduced Mixmatch with comprehensive unit tests and PyTorch Lightning.
- **Tetris Battle – A New Environment for Single-Mode and Double-Mode Game**
  An self-driven project on reinforcement learning (RL)
  - Proposed an environment which helps develop RL algorithms, especially when the computational resources are limited.
  - Trained a RL agent with Proximal Policy Optimization (PPO) to play the game.

Honors

- NeurIPS Scholar Award 2022
- Appier AI top conference scholarship 2020
- Fifth place in the Large Vocabulary Instance Segmentation (LVIS) Challenge at ICCV2019 2019

Professional Activity

- **Conference Reviewer or Program Commitee**
  - **CVPR**(2023-2025) **NeurIPS**(2022-2024) **EMNLP**(2022) **AAAI**(2023) **ACL**(2023) **ARR**(2023) **ICML**(2023-2025) **ICLR**(2023-2025) **ICCV**(2023)
- **Talks**
  - **Training Neural Networks with Fixed Sparse Masks,** NeurIPS Taipei Meetup (2021)
  - **A Hierarchical Approach for Document Analysis,** NTU (2020)
  - **Difference-Seeking Generative Adversarial Network – Unseen Data Generation,** Appier (2020)

Techniques

- **Programming Skills:** C++, Python, PyTorch, TensorFlow, Keras, Linux, LaTeX
- **Open Source Contributions:** PyTorch, PyTorch Lightning, DALLE-pytorch