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 – Present*
  - 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 – 2019. June*
  - 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***, 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*
  - Researched 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

- **Cinnamon AI Taiwan** — Taipei, Taiwan
  AI researcher — *Mar. 2020 – Present*
  - Accelerated the company's main models by 25% without sacrificing the accuracies 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

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

Talks

- **NeurIPS Taipei Meetup,** Training Neural Networks with Fixed Sparse Masks — 2021
- **NTU,** A Hierarchical Approach for Document Analysis. — 2020
- **Appier,** Difference-Seeking Generative Adversarial Network – Unseen Data Generation — 2020

Techniques

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