Yi-Lin Sung
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Research Interest

Deep Learning, Machine Learning and Computer Vision.

Education

- **National Taiwan University** — Taipei, Taiwan
  Master of Science in Graduate Institute of Communication Engineering (GICE) — *Sep. 2017 – 2019. July*
  - Overall GPA: 4.14/4.3
  - Thesis: Difference-Seeking Generative Adversarial Network – Unseen Data Generation
    - Proposed a general framework to generate multiple kinds of complement data, and apply these data to some applications, such that semi-supervised learning and novelty detection. Our method speeds up the training and attains competitive results.
- **National Taiwan University** — Taipei, Taiwan
  Bachelor of Science in Chemical Engineering (CHE) — *Sep. 2012 – Jan. 2017*
  - Overall GPA: 3.77/4.3, CS-related GPA (33 credits): 3.91/4.3

Publications

- **Yi-Lin Sung**, Jun-Liang Lin, Cheng-Yao Hong, Tyng-Luh Liu, "The Maximum A Posteriori Estimation of DARTS". *in submission.*
- **Yi-Lin Sung**, Cheng-Yao Hong, Yen-Chi Hsu, "Video summarization with anchors and multi-head attention". *in submission.*
- **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)*, Apr. 2020.
- **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*, Dec. 2019.

Honors

- Fifth place in the Large Vocabulary Instance Segmentation (LVIS) Challenge at ICCV2019.

Work/Research Experiences

- **Institute of Information Science, Academia Sinica** — Taipei, Taiwan
  Part time research assistant. Advisor: Dr. Tyng-Luh Liu — *Sep. 2018 – Present*
  - Researched in the topic of video summarization with few video data.
    - Tried to use domain adaptation to transfer the knowledge from text summarization to video summarization.
    - Improved my model to get the direct relationships between inputs through adding graph convolution layers.
  - Researched in the topic of improving Differentiable Architecture Search (DARTS).
  - Participated in the LVIS competition.
- **Institute of Information Science, Academia Sinica** — Taipei, Taiwan
  Intern. Advisor: Dr. Tyng-Luh Liu — *July. 2018 – Aug. 2018*
  - Research topic: supervised video summarization.
    - Implemented the whole pipeline for training a summarizer: pre-processing videos, training models and post-processing summaries.
- **National Taiwan University** — GICE, NTU
  Teaching Assistant. Instructor: Dr. Hung-Yi Lee — *Jan. 2018 – Jun. 2018*
  - Course: Machine Learning and Having It Deep and Structured.
  - Responsible for the first homework: Validating the Theories of Neural Network through Experiments.

Projects

- **Tetris Battle – A New Environment for Single mode and Double Mode Game**
  An on-going project on reinforcement learning (RL)
  - Proposed an environment which is helpful for developing novel algorithms about reinforcement learning, self-playing and imitation learning, especially when the computational resources are limited.
  - Trained a RL agent with Proximal Policy Optimization (PPO) to play the game.
- **Few-Shot Learning on CIFAR-100 with Graph Neural Network**
  State-of-the-art method of few-shot learning
  - Implemented the paper "Few-Shot Learning with Graph Neural Networks" and do the experiments on CIFAR-100, which is rarely used in few shot learning.
- **Adversarial Training and Visualization**
  Visualizing the differences between robust features and standard features
  - Implemented the paper "Robustness May Be at Odds with Accuracy" to observe differences of deep features learned by standard training and adversarial training.
- **Weakly-Supervised Learning for Finding Detection in Medical Images [paper]**
  Localizing the area causing a disease without information of its location
  - Trained CheXNet with different backbone networks, such as VGG, ResNet and DenseNet. Moreover, we use Class Activation Mapping (CAM) to get the activation maps of inputs, and predict bounding boxes according to them.

Related Courses

Mathematics	Calculus (I)(II) / Engineering Mathematics (I)(II) / Linear Algebra / Applied Algebra / Advanced Statistical Inference (I) / Mathematical Principles of Machine Learning
Computer Science	Computer Programming / Data Structures and Algorithms / Algorithm Design and Analysis / Computer Architecture / Operating Systems / Computer Graphics / Discrete Mathematics / Computer Vision / Digital Signal Processing
Machine Learning	Machine Discovery / Machine Learning / Machine Learning and Having It Deep and Structured / Deep Learning for Computer Vision

Techniques

- **Programming Skills:** C++, Python, MATLAB, JAVA, PyTorch, TensorFlow, Keras, Linux, LaTeX
- **Knowledges:** GAN, semi-supervised learning, novelty detection, reinforcement learning, video summarization