Gi-Luen (Allen) Huang

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Summary

4+ years of research experience in computer vision, deep learning, and machine learning. Highly adept at detection, recognition and generation models, data analysis and visualization. Passionate about the development of ML techniques and algorithms to solve real-world problems.

Education

National Taiwan University *Feb 2021 - Jan 2023*
MS in Data Science, GPA: 4.30/4.30 *Taipei, Taiwan*

- **Courses**: Machine Learning, Deep Learning for Computer Vision, Computer Vision, Convex Optimization, Time-Frequency Analysis and Wavelet Transform
- **Thesis**: "CTGAN: Cloud Transformer Generative Adversarial Network"
- **Advisor**: *Prof. Pei-Yuan Wu*

National Taiwan University of Science and Technology *Jun 2017 - Jan 2021*
BS in Electrical Engineering, GPA: 4.09/4.30 *Taipei, Taiwan*

- **Courses**: Data Structures, Algorithm design and analysis, Programming
- **Paper publication**: "Face Expression and Tone of Voice for Deception System"
- **Advisor**: *Prof. Jing-Ming Guo*

Work Experience

Jubo Healthn *Jul 2022 - Aug 2022*
Machine Learning Engineer Inter *New Taipei, Taiwan*

- Collaborate with colleagues to develop MLops
- Improve the existing classification model in the company with **about 3% accuracy**
- Deploy the model as a service using Docker on GCP

Neurobit Technologies *Feb 2022 - Jun 2022*
Machine Learning Engineer Intern *Taipei, Taiwan*

- Develop the gaze estimation model by introducing self-supervised learning, which reduces the **gaze error from 10 degrees to 1 degree**
- Detect the torsional rotation of the eyes using feature matching algorithm
- Write the journal paper with the company

Taiwan Semiconductor Manufacturing Company (TSMC) *Jul 2021 - Aug 2021*
Information Technology (IT) Intern *Hsinchu, Taiwan*

- Full-stack system integration
- Deploy the website using Docker and Kubernetes

TA Experience

NTU - Deep Learning for Computer Vision *2022 Fall*
MS student in Graduate Institute of Communication Engineering *Taipei, Taiwan*

Advisor: *Prof. Yu-Chiang Frank Wang*

- Design and grade homework sets
  - Generative Adversarial Network (GAN)
  - Conditional Diffusion models (DDPM)
  - Domain Adaptation model (DANN)
  - Final project: 3D Indoor Scene Long Tail Segmentation
- Motivate students during TA office hours

ITRI - Machine Learning *Sep 2022 - Oct 2022*
MS student in Graduate Institute of Communication Engineering *Hsinchu, Taiwan*
Advisor: *Prof. Pei-Yuan Wu*

- Design programming exercises
  - PM2.5 prediction (Regression model)
  - Income prediction (Classification model)
  - Facial Emotion Recognition
  - Text Sentiment Classification
  - Dimension Reduction
  - Image Event Anomaly Detection

NTU - Time-Frequency Analysis and Wavelet Transform *2021 Fall*
MS student in Graduate Institute of Communication Engineering *Taipei, Taiwan*
Advisor: *Prof. Jian-Jiun Ding*

- Grade the homework sets

NTU - Data Structure *2021 Spring*
MS student in Graduate Institute of Communication Engineering *Taipei, Taiwan*
Advisor: *Prof. Pei-Yuan Wu*

- Design and grade the theoretical homework set
  - Big-O notation definition
  - Red-black tree
  - Disjoint sets
  - Binary search tree
  - AA tree
- Design and grade the programming homework set
  - Dynamic Programming (DP)
  - Tree data structure implementation

Projects

Pupil Tracking Github Link, *2022 Spring*
NTU - Computer Vision (Final project)
Instructor: *Prof. Shao-Yi Chien*

- Combine the deep learning model Deeplab-v3-plus with the traditional CV method to obtain pupil segmentation.
- **Private leaderboard: 3/21, Top3**

Orchid Species Identification and Classification Github Link, *Apr 2022 - Jun 2022*
2022 T-Brain Competition

- Apply ConvNext and Swin_transformer to conduct image recognition task

- Apply data augmentation methods to enhance models' generalization ability, including random crop, random rotation, Mixup, random erasing, etc.
- **Private leaderboard: 14/743, Top3%**

Lung Adenocarcinoma Pathological image segmentation Github Link, *Mar 2022 - Jun 2022*
2022 T-Brain Competition

- Develop Deeplab-v3-plus to segment the cells having STAS features
- Develop the post-processing method to fill in holes after model prediction
- Apply data augmentation methods to enhance the models' robustness, including horizontal/vertical flip, random rotation, color jitter, etc.
- **Private leaderboard: 2/307, Top1%**

Crops Status Monitoring by Image Recognition Github Link, *Mar 2022 - May 2022*
2022 AIdea Competition

- Develop ConvNext and Resnet50 models to do ensemble prediction
- Apply data augmentation methods during training, including horizontal/vertical flip, affine transformation, etc.
- Apply Grad-cam to visualize the attention location of model prediction
- **Private leaderboard: 3/428, Top1%**

Human Voice Denoising Github Link, *Feb 2022 - May 2022*
2022 AIdea Competition

- Based on U-net, develop a 1d-convolutional neural network as an autoencoder
- Apply data augmentation methods during training, including reverb, remix, shift, etc.
- Combine time domain and frequency domain loss functions
- **Private leaderboard: 6/282, Top2%**

Intracranial Hemorrhage Prediction Github Link, *2021 Fall*
NTU - Application of Deep Learning in Medical Imaging
Instructor: *Joe Yeh*

- Develop an ensemble model of Resnet50 and SEresnet50 to conduct multi-label classification problem

Traditional Chinese Scene Text Recognition Github Link, *Nov 2021 - Dec 2021*
2021 T-Brain Competition

- Apply Yolov5 for signboard detection
- Develop Resnet18 model to conduct ROI transformation
- Develop modified Vision Transformer to conduct text recognition
- Apply data augmentation methods during training, including horizontal/vertical flip, affine transformation, resolution transformation, etc.
- **Private leaderboard: 6/128, Top5%**

Adversarial Attack on Deception Detection Github Link, *2021 Fall*
NTU - Security and Privacy of Machine Learning
Instructor: *Prof. Shang-Tse Chen*

- Design experiments about adversarial attack on deception detection

Publications

Huang, Gi-Luen and Pei-Yuan Wu (2022). "CTGAN : Cloud Transformer Generative Adversarial Network". In: *2022 IEEE International Conference on Image Processing (ICIP)*, pp. 511–515. DOI: 10.1109/ICIP46576.2022.9897229.

Li-Wei Hsiao, Jing-Ming Guo, **Gi-Luen Huang**, *et.al.* "Face Expression and Tone of Voice for Deception System". 2020 International Conference on System Science and Engineering (ICSSE), 2020 (Best student paper award)

Award/Scholarships

Pan Wen Yuan Foundation Scholarship *2022*
MS student in Graduate Institute of Communication Engineering *Taipei, Taiwan*

Outstanding student *2021*
Department of Electrical Engineering at NTUST *Taipei, Taiwan*

Skills

Programming	Python (main), C++
Frameworks	PyTorch, Flask, PyTest
Developer Tools	Git, Vim, Docker
Libraries	Pandas, Numpy, Scikit-learn, Matplotlib, XGBoost
Markup Languages	LaTeX, Markdown