Gi-Luen (Allen) Huang

come880412 | GiLuenHuang | come880412@gmail.com | +886-939273151

Summary

3+ 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 Group of Communication Engineering, GPA: 4.30/4.30 *Taipei, Taiwan*
Transcript

- **Courses**: Machine Learning, Deep Learning for Computer Vision, Applied Deep Learning, Deep Learning for Human Language Processing, 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*
Transcript

- **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 Experiences

MobileDrive Technology *Jun 2023 - Present*
Machine Learning Engineer *New Taipei, Taiwan*

- Develop an auto-labeling system and build the model for vehicle trajectory planning
- Deploy the trained model to an embedded system, including conversion from Torch to ONNX format and model quantization
- Develop a C++ program for executing model inference on the embedded system

Jubo Health *Jul 2022 - Aug 2022*
Machine Learning Engineer Intern *New Taipei, Taiwan*

- Implement model algorithms for the different tasks, such as recognition, segmentation, and object detection, to 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 Experiences

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
  - AA tree
- Design and grade the programming homework set
  - Dynamic Programming (DP)
  - Tree data structure implementation

AI Competitions

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

- 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, Top 3%**

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

- 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, Top 1%**

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

- 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, Top 1%**

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

- 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, Top 2%**

Traditional Chinese Scene Text Recognition (Advanced) *Nov 2021 - Dec 2021*
2021 T-Brain Competition Github Link

- 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, Top 5%**

Traditional Chinese Scene Text Recognition (Intermediate) *Aug 2021 - Oct 2021*
2021 T-Brain Competition Github Link

- Apply Yolov5 to capture the subword from a word
- Develop arcMargin loss function on Resnet18 model
- Apply data augmentation methods during training, including horizontal/vertical flip, affine transformation, resolution transformation, etc.
- **Private Leaderboard: 5/183, Top 3% and Innovation Award from T_brain**

Rice Plant Position Labeling in UAV full-color image *Aug 2021 - Oct 2021*
2021 AIdea Competition

- Apply Yolov5 to capture the rice plant location
- Apply rule-based post-processing to deal with the overlapping region after the sliding window method
- Apply data augmentation methods during training, including horizontal/vertical flip, affine transformation, resolution transformation, etc.
- **Private Leaderboard: 18/523, Top 3%**

Selected Projects

Pupil Tracking *2022 Spring*
NTU - Computer Vision (Final Project) Github Link
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**

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

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

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

- Design experiments about the adversarial attack on deception detection

Fine-grained Food Classification *2021 Fall*
NTU - Deep Learning for Computer Vision (Final Project) Github Link
Instructor: *Prof. Yu-Chiang Frank Wang*

- Design a cosine sampling method to deal with the data imbalanced problem
- Implement arcface loss function so that the extracted features can be separated in high-dimensional space

Publications

Chen, P. W., Yang, T. S., Huang, **G. L., Huang** *et al.*(2023). Viewing Bias Matters in 360° Videos Visual Saliency Prediction. IEEE Access.

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