

# Gi-Luen (Allen) Huang

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## SUMMARY

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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

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### 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 EXPERIENCE

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### 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 EXPERIENCE

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### NTU - Deep Learning for Computer Vision

MS student in Graduate Institute of Communication Engineering

Advisor: Prof. Yu-Chiang Frank Wang

2022 Fall  
Taipei, Taiwan

- 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

MS student in Graduate Institute of Communication Engineering

Advisor: Prof. Pei-Yuan Wu

Sep 2022 - Oct 2022  
Hsinchu, Taiwan

- 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

MS student in Graduate Institute of Communication Engineering

Advisor: Prof. Jian-Jiun Ding

2021 Fall  
Taipei, Taiwan

- Grade the homework sets

### NTU - Data Structure

MS student in Graduate Institute of Communication Engineering

Advisor: Prof. Pei-Yuan Wu

2021 Spring  
Taipei, Taiwan

- 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

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### [Orchid Species Identification and Classification](#)

2022 T-Brain Competition

Apr 2022 - Jun 2022  
[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](#)

2022 T-Brain Competition

Mar 2022 - Jun 2022  
[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 AIda 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 AIda 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 AIda 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

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### Pupil Tracking

NTU - Computer Vision (Final Project)

Instructor: Prof. Shao-Yi Chien

2022 Spring

[Github Link](#)

- 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

NTU - Application of Deep Learning in Medical Imaging

Instructor: Prof. Joe Yeh

2021 Fall

[Github Link](#)

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

### Adversarial Attack on Deception Detection

NTU - Security and Privacy of Machine Learning (Final Project)

Instructor: Prof. Shang-Tse Chen

2021 Fall

[Github Link](#)

- Design experiments about the adversarial attack on deception detection

### Fine-grained Food Classification

NTU - Deep Learning for Computer Vision (Final Project)

Instructor: Prof. Yu-Chiang Frank Wang

2021 Fall

[Github Link](#)

- 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

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**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](https://doi.org/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

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### Pan Wen Yuan Foundation Scholarship

MS student in Graduate Institute of Communication Engineering

2022

Taipei, Taiwan

### Outstanding Student

Department of Electrical Engineering at NTUST

2021

Taipei, Taiwan

## SKILLS

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

Last updated: February 4, 2023