

# Yu-Hang (Arthur) Chien

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## EDUCATION

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### Carnegie Mellon University, School of Computer Science

*Master of Science in Artificial Intelligence and Innovation*

Pittsburgh, PA

Aug. 2024 – Ongoing

- Courses: 15-513 Introduction to Computer Systems

### National Chengchi University

*Bachelor of Science in Management Information Systems*

Taipei, Taiwan

Aug. 2019 – Jan. 2024

- GPA: 4.0/4.3
- Courses: Operating System, Machine Learning, Deep Learning, Data Structure, Algorithm, Computer Network, Database Management Systems, Distributed Systems

## WORKING EXPERIENCE

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### Research Assistant

*Data Mining and Machine Learning Laboratory, Academia Sinica*

Apr. 2023 – July 2023

Taipei, Taiwan

- Developed a similarity module to determine document similarities by employing SimGNN on document flow graphs, SimHash for text comparison, and analyzing the relationship graph of the target document
- Implemented SpanBERT for Chinese coreference resolution
- Created a discrete denoising diffusion model for social graph generation

### Research Assistant

*Decision and Quantitative Analysis Laboratory, National Chengchi University*

Feb. 2023 – July 2023

Taipei, Taiwan

- Designed a component multi-layer perceptron (cMLP) and composed-cMLP to predict Granger causality for endogenous VAR data and complex retail data
- Conducted paper surveys in the domains of deep learning, anti-money laundering in Bitcoin, integrated gradients, VAR, and Granger causality

## PROJECTS

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### Automated Hit-frame Detection for Badminton Match Analysis

*#PyTorch, #Flask, #Transformer, #Computer Vision, #Video Learning, #Badminton Analysis, #Git*

- Created an automated tool to detect hit-frames, converting badminton videos into analyzable data
- Proposed a novel **transformer** that predicts shuttlecock direction sequences based on **RCNN**-detected player keypoint sequence
- Achieved 81% accuracy in trimming rally frames from videos based on shot angles
- Attained 96% accuracy in detecting hit-frames based on the shuttlecock's flight direction

### Pupil Learning Mechanism

*#PyTorch, #Vanishing Gradients, #Overfitting, #Neural Network, #Optimization Algorithm*

- Introduced pupil learning procedure to adjust the structure and weights of 2-layer neural networks during training
- Tackled issues of vanishing gradients and overfitting in neural networks
- Evaluated the PLM module, demonstrating its superiority over linear regression models and backpropagation-based 2-layer neural networks

### SeekIntern – A Smart Internship Search Engine

*#Java, #Boyer-Moore Algorithm, #Data Structures, #PostgreSQL, #Git, #Optimization Algorithm*

- Developed a Java application to execute Google search functionality
- Structured search results into a prioritized tree format
- Applied the Boyer-Moore Algorithm for efficient keyword matching
- Simplified the process of finding relevant internships by prioritizing web pages based on internship-related keyword occurrences

### Application of Apache Kafka in Real-Time Stock Monitoring System

*#Node.js, #Kafka, #MongoDB, #PostgreSQL, #RESTful API*

- Built Kafka producers with Node.js to crawl data on 175 semiconductor stocks and evaluate stock prices, triggering alert notifications
- Utilized the Stochastic Oscillator, Bollinger Bands, and SMA to develop an alert system
- Developed Kafka consumers to handle alerts and store them in MongoDB, and implemented a RESTful API to process frontend requests from React.js

### **Malloc Lab**

*#C, #Dynamic Memory Allocator, #Memory Allocator, #Segregated Free List, #64-bit Architecture*

- Built a dynamic memory allocator for a 64-bit architecture
- Implemented a segregated free list with boundary tags for coalescing free blocks
- Utilized Best Fit Algorithm for searching free blocks
- Provided 'malloc', 'free', 'realloc', and 'calloc' functions that manage memory in the heap

## **AWARDS**

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### **Dean's List**

- Fall 2021, Spring 2022, and Fall 2022

### **International ICT Innovative Services Awards, 2022**

- 1st Place Winner in the Asia-Pacific
- 3rd Place Winner in the AI Category

### **Research Grant for Undergraduate Students**

- Awarded by National Science and Technology Council

## **ACTIVITY**

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### **Co-Founder of the MIS Futsal Club**

- Led the team to win third place in the 2022 Intercollegiate Cup

### **Secretary of the MIS Student Association**

- Organized multiple career seminars and kept records of departmental meetings

## **TECHNICAL SKILLS**

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**Programming Languages:** Python, Java, C/C++, SQL (Postgres), JavaScript, HTML/CSS, R

**Developer Tools:** Git, Github Docker, VS Code