Yu-Hang (Arthur) Chien

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Education

Carnegie Mellon University, School of Computer Science — Pittsburgh, PA
Master of Science in Artificial Intelligence and Innovation — *Aug. 2024 – Ongoing*

- Courses: 15-513 Introduction to Computer Systems

National Chengchi University — Taipei, Taiwan
Bachelor of Science in Management Information Systems — *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

Research Assistant — Apr. 2023 – July 2023
Data Mining and Machine Learning Laboratory, Academia Sinica — *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 — Feb. 2023 – July 2023
Decision and Quantitative Analysis Laboratory, National Chengchi University — *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

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

Shell Lab

#C, #Unix system calls, #Signal Handling, #Process Control

- Developed a simple Linux shell program called tsh (tiny shell) to support job control and I/O redirection.
- Implemented built-in commands such as quit, jobs, bg, and fg for managing shell operations.
- Created handlers for SIGCHLD, SIGINT, and SIGTSTP signals to manage process control and ensure the shell responded correctly to user interrupts.

Proxy Lab

#C, #HTTP Proxy Server, #POSIX Threads, #Socket Programming, #Network Programming

- Developed a multi-threaded HTTP proxy server handling concurrent client requests using POSIX threads.
- Implemented robust error handling to ensure continuous operation and appropriate HTTP error responses.
- Utilized robust I/O package and custom HTTP parser for efficient request parsing and header management.

Awards

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

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

Programming Languages: Python, Java, C/C++, SQL (Postgres), JavaScript, HTML/CSS, R
Developer Tools: Git, Github Docker, VS Code