Tai-Chi learning system

Augmented Reality /C#/Unity/Gitlab

As a Project Assistant at the Image and Vision Laboratory, National Taiwan University, I developed and integrated innovative features into an Augmented Reality Tai-Chi learning system using Unity and C#, while redesigning the user interface for improved usability. I resolved compatibility issues between the system, Mixed Reality Toolkit, and Hololens2, reducing the project timeline by 20%. Collaborating with engineers through GitLab, I conducted code reviews and maintained documentation.

SmileVerse

Virtual Reality/C#/Unity

As a Project Assistant at the Image and Vision Laboratory, National Taiwan University, I designed the algorithm, mechanism, and narrative for a Virtual Reality project on HTC VIVE Pro Eye using Unity and C#, enhancing the immersive experience by capturing users’ facial expressions in real-time with the VIVE Facial Tracker. The project received 82% positive feedback from users, who reported that the interactions significantly boosted their emotional engagement.

Synergistic Leadership Theory Website

Ruby / Rails / HTML / CSS / JavaScript / Testing / Git

Collaborated within a team to develop a dynamic website using Ruby on Rails, from inception to deployment on Heroku, implementing CI/CD practices. Achieved 95% test coverage with RSpec and Cucumber, employing both TDD and BDD methodologies. As Scrum Master, I facilitated agile practices, managed the project with Pivotal Tracker, and organized regular meetings with team members and clients to ensure alignment and track progress.

**Handwritten Digit Recognition**

Python / PyTorch / CNN / RNN

Developed CNN and RNN models for processing image and audio data using the MNIST handwritten digit dataset. Augmented the feature representation by concatenating embeddings from two modalities, maintaining flexibility and adaptability in the multimodal deep learning framework. Achieved a validation accuracy of 99.64% and 99.5% accuracy on the up-to-date test data.

**Parallelizing Strassen’s Matrix-Multiplication Algorithm**

C++ / OpenMP

Implemented a parallel algorithm for Strassen’s matrix multiplication using OpenMP with 8 threads to optimize computational efficiency. Conducted a comprehensive analysis of the algorithm's performance, focusing on matrix size and terminal size to understand scalability and resource utilization. Achieved a significant speedup of 24.72, demonstrating substantial performance gains, and an efficiency rate of 3.09, highlighting the algorithm's ability to maintain high computational throughput even as problem size increased.

Meme Generator

Python/OOP/web-scraping

Collaborated with a team to develop a meme-generation tool using Python, Selenium, Pillow, and an edit distance algorithm, following Object-Oriented Programming principles. Led the project and orchestrated the implementation of a robust image-scraping function. The tool was successfully used by a local comedian to generate engaging Chinese riddle jokes, showcasing its practical application and effectiveness in creating captivating content.

**National Taiwan University Lottery (NTU Lottery)**

Python/HTML/CSS/Heroku/web scraping

Led a team to develop a Python program for scraping draw-related posts from the Facebook NTU club. Utilized HTML/CSS and Heroku to deploy the data on user-friendly websites, enabling users to sort posts by criteria such as time, number of comments, and number of likes. Optimized the scraping algorithm, achieving a 25% increase in speed compared to the original implementation, which enhanced the efficiency and performance of the data retrieval process.

Rocket escape game

C#/Unity

Developed a rocket escape game with Unity3D and C#. Utilized 3D models and 3D animations with combinations of different sounds affect to create the game. Published the game on the free share websites.