Xuanpei Chen

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EDUCATION

The University of Manchester, BSc in Computer Science *Sep. 2024 - Dec. 2027*

Areas of Interest: Reinforcement Learning, Backend Development, Game Development

Shanghai Thomas School *Jul. 2021 - Jul. 2023*

A-levels: Mathematics(A*), Further Mathematics(A*), Physics(A*), Computer Science(A)

EXPERIENCE

Iluvatar CoreX

Jul. 2024 - Sep. 2024

Internship: Test Engineering Engineer *Shanghai, China*

- Independently developed the "Auto Dump" project, automating model operator dumping with **Jenkins** within the company, avoiding cross-system switches and manual function searches, boosting efficiency by over **90%**.
- Built **DQN** and **PPO** models using **PyTorch** and applied the **PPO** model to a personal project.
- Acquired proficiency in **SSH** remote connections, setting up and managing a personal server.
- Gained experience with **Docker** and **Kubernetes**, creating and deploying **Docker** images to the server.

University of Manchester Autumn Game Jam 2024

Oct. 27, 2024 - Oct. 30, 2024

Project: Stop Ghosting Me - github.com/Caesar723/Stop-Ghosting-Me *Manchester, UK*

- Developed a game using **Unity** as the game engine in a two-person team.
- Achieved second place in the competition with innovative multi-window interactions.
- Use of **Netcode** for establishing local connections and enabling multi-window interactions.

Google Chrome Built-in AI Challenge

Nov. 13, 2024 - Nov. 29, 2024

Project: Noddy - devpost.com/software/noddy *Manchester, UK*

- Participated in a three-person team project
- Using Google's built-in AI, including Prompt API, Language API, and Translation API.
- Created a tree diagram using **D3.js** to display data structures and relationships.

PROJECTS

Magic Fan Made - Personal Project

Jan. 2024 - Present

Game github (includes demo video in the readme): github.com/Caesar723/Magic

Magic Game website: www.xuanpei-chen.top:8000/ (Please use chrome browser to access)

- Created a server image using **Docker** and deployed it on Alibaba Cloud.
- Made a developer environment image with **Docker** and **Kasm** for easy development.
- Developed backend using **Python** and **FastAPI** with **SQLAlchemy** for database operations and implemented async features, card drawing, and stack mechanisms.
- Built the frontend using **JavaScript** and **Canvas 2D**, enabling real-time interaction via **WebSocket**.
- Created pseudo-3D effects and smooth animations using matrix transformations and action queues.
- Integrated **PPO** reinforcement learning as the AI for card gameplay, enabling it to play cards like a human player.
- Enabled users to create their own DIY cards using **RestrictedPython** for a creative workshop.

Birthday gift for KaKa - Personal Project

Jul. 2023 - Aug. 2023

Github: github.com/Caesar723/Birthday_gift_for_KaKa

- Implemented various fireworks shapes and trajectories using **OpenGL**, utilizing mathematical and mechanical calculations to simulate realistic motion.
- Designed an efficient particle system using **Numpy** and memory pool management for optimal resource allocation and utilization.
- Developed a pointer polling algorithm to dynamically allocate particle memory, reducing fragmentation and improving performance.
- Optimized rendering performance with **VBO** and **Display Lists**, significantly enhancing the rendering of dynamic and static objects.

TheDayOfSagittarius3 - Personal Project

Apr. 2022 - Jun. 2022

Github: github.com/Caesar723/TheDayOfSagittarius3

- Developed the game core using **Python** and **Pygame**, leveraging multiprocessing to separate game logic and network communication for improved stability and responsiveness.
- Implemented **asyncio** for asynchronous socket communication, ensuring real-time data transmission.
- Connected **C++** dynamic libraries using **ctypes** and **numpy.ctypeslib** for intensive computations, achieving a 20x perf boost.
- Bypassed **Python**'s **GIL** using **ctypes** and multithreading to further enhance performance.

SKILLS

Language: CSS, HTML5 Canvas, JavaScript, Python, C#

Technology stack: Async, FastAPI, Multiprocessing, Multithreading, NumPy, OpenGL, Pygame, PyTorch, Reinforcement Learning, SQLAlchemy, WebSocket,Pandas

Tools: Docker, Git, MySQL, Vim