Atlanta, GA
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Myungjin Shin

https://mjsh34.github.io/portfolio/

I am a software engineer and a researcher in graphics and AI interested in building web/desktop applications involving computer graphics, computer vision, and machine learning.

Technologies and Languages

- Languages: Python, Java, C++, JavaScript, C#
- Technologies: PyTorch, Pandas, OpenCV, Linux server administration, Git, Django, Flask, aiohttp, Express, MySQL, Postgres, MongoDB, AWS, Firebase, CMake, Scrapy, React, NodeJS, PyQT, JavaFX, Godot Engine, LaTeX, Wireguard
- Other: Machine/Deep learning, applications utilizing computer vision, graphics, image generation, LLM

Work Experience

Lead Software Developer & ML Engineer **MeTown** **2023 - Present**
Recommendation system Seoul, South Korea (Remote)

- Developed a recommendation system for predicting clothing sizes preprocessing purchase data and training and testing with XGBoost, as a microservice in Python using the aiohttp framework.

  Our algorithm increased the accuracy of size prediction by 10% over the previous algorithm, such that it could be deployed to an online shopping mall, reducing human labor (manual recommendation) and reducing refunds due to size mismatch.
- Developed a REST API in Express with JWT-based authentication, using MongoDB to track API usage.
- Developed an asynchronous web scraper for size data and customer reviews from a popular online shopping mall for clothing.

Researcher **Computer Graphics Lab** **2022 - 2023**
Seoul, South Korea

- Lead a research project tackling the problem of reconstructing full body poses from only signals from a consumer VR device for immersive VR experiences, surpassing state of the art performance (project page).
- Collaborated on a research project on enhancing the text following capabilities of Stable Diffusion. Developed ComfyUI node to test the model interactively and improve accessibility of our modified model (project page).

Software Developer (Part Time) **Center for High Throughput Computing** **Mar 2022 - May 2022**
Madison, WI

- Worked on HTCondor, large open-source distributed high throughput computing system written in C++.
- Sorted an array at compile time utilizing compile time constants and functions in C++ 20 improving lookup performance.

Software Developer **KOG** **2018 - 2020**
Daegu, South Korea

- Developed a GUI application for light simulation in C++. Develop image filters, convert between color spaces, and add various UI elements to visualize simulation results.
- Developed an AR application in Unity displaying virtual screens above a moving object by tracking special markers.

Education and Certifications

- **M.Sc. Computer Science,** Georgia Institute of Technology, GA. **2024 - Present**
- **B.Sc. Computer Science and Engineering,** Yonsei University, South Korea. **2016 - 2018, 2021 - 2023**

Projects

- **Ray tracer -** Ray tracer written in C++. Supports basic materials, camera movement, antialiasing and defocus blur. View the source on GitHub.
- **ComfyUI custom node -** A set of custom nodes developed for ComfyUI (a node-based image/media generator for Stable Diffusion-like generative AI models). Used JavaScript and Python. Officially registered on Comfy Registry (link).
- **OCR engine -** Korean OCR engine trained from scratch with my own dataset based on an open source scene text recognition model.
- **Web crawlers** - I developed various web crawlers throughout my career. One for scraping the product catalogue, product descriptions and reviews from a popular Korean shopping mall Musinsa (GitHub) and another for scraping stock images (GitHub) have source codes published online.
- **Generative AI** - I make use of many generative AI such as Stable Diffusion and open source LLMs for various personal projects. I have fine tuned Stable Diffusion XL on a large dataset of free stock images to generate similar images. I try to keep up with the latest technology in fields of interest by following AI researchers online and reading peer-reviewed publications.

Open source contributions:

- **Godot Engine bug fix -** Godot Engine, a popular open source game engine written in C++ had a bug with its C# scripting engine where scene inheritance was not handled properly. It was my first time contributing to a large open source C++ codebase and working with Mono (C# runtime), but after carefully studying the code base and applying fixes my pull request was merged successfully (original PR, additional PR for backporting).
- **TagGUI (image tagging software) -** A Qt6 GUI for tagging images. While using this software to build a Korean OCR dataset, I realized that even though in most cases autocompletion is helpful due to the fact that many images share the same tags, when most tags are unique, the autocompletion was causing delays sometimes leading to typos. I raised an issue followed by a pull request (merged) to optionally turn off this feature, resulting in enhanced usability for building OCR datasets.
- **ImageReward** (ML model for scoring images) - Fixed a bug with a plugin not displaying text after update.

Extracurricular

- **Personal Servers** - I manage multiple Linux servers for data storage, integrity checks, backups, and job scheduling for personal projects.
- **Badgerloop UI** - I was part of a team developing an interactive UI in React for Badgerloop, a student club developing an autonomous driving solution.
- **Japanese Language Certificate (JLPT N1)** - I have a JLPT certificate for the highest level of proficiency in Japanese.
- **Seminars** - I have hosted and participated in many small group seminars in the Computer Graphics Lab, where I gave presentations on ML models that generate human motion, neural network architectures and diffusion models.

Interests

- Linux server administration, data security and backup. Manage VPNs.
- Video game development, making music.
- Using generative AI to create virtual worlds for videos and games.