Musab Fiqi

.NET Fullstack Developer
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Summary

Results-driven software developer and recent graduate with 3+ years of experience in .NET C#, Python, and computer graphics, specializing in machine learning, game development, and 3D rendering. Expertise developed through hands-on projects and a Master's degree in Computer Science & Engineering, with a strong focus on real-time graphics, physically-based rendering (PBRT), and AI systems. Proven track record in developing scalable software solutions using modern frameworks like WebGPU, Unity, and TensorFlow, with a demonstrated ability to collaborate on cross-disciplinary teams.

Experience

Associate Software Developer May. 2023 – Aug. 2023
Department of Food, Agricultural, Biological and Environmental Engineering at Ohio State *Columbus, OH*

- Trained a CNN model for weed detection using Jetson Nano devices integrated with drones.
- Enhanced data preprocessing pipelines by implementing Python-based multi-threading to handle large-scale video frame extraction, processing 12TB of data thereby improving model accuracy.
- Ran noise reduction over the processed which helped increase the accuracy of the CNN model by 7% (from 89% to 96%).

Assistant Research Programmer May. 2022 – July. 2022
National Science Foundation *Columbus, OH*

- Developed JavaScript-based dynamic study behaviors within the Lioness Labs tool, collaborating with a team to meet research objectives for an NSF-funded study.
- Improved software usability and functionality based on real-time feedback from research teams.

Education

3.6/4.0 GPA

Master's of Science in Computer Science & Engineering Columbus, OH
The Ohio State University *Aug. 2023 – Dec. 2024*

Bachelor's of Science in Computer Science & Engineering Columbus, OH
The Ohio State University *Jan. 2020 – May 2023*

Associate's of Science Columbus, OH
Columbus State Community College *Jan. 2018 – Dec. 2019*

Master's Project

Tetrahedral Volume Rendering of Unstructured Data Jan. 2024 – Dec. 2024
Department of Computer Science & Engineering at OSU *Columbus, OH*

- Developed a WebGPU-based renderer for efficient visualization of complex datasets through direct volume rendering and ray tracing algorithms, specifically designed for tetrahedral meshes.
- Implemented a sequential mesh traversal algorithm that accumulates color and alpha values to accurately visualize complex, unstructured data.
- Achieved visualization of turbulent airflow around a golf ball.
- Identified performance limitations due to CPU-intensive pre-processing steps; future work will focus on utilizing WebGPU compute shaders to offload these steps and enable real-time rendering of larger, more complex datasets.

Technical Skills

Languages: C#, Python, C++, Java, SQL, JavaScript, x86 Assembly, Scheme
Frameworks: .NET Framework, Model-View-Controller, JUnit, MonoGame, Makefile
Developer Tools: Visual Studio, Visual Studio Code, Git, SVN, Linux, Bash, Agile/Scrum
Graphics: PBRT, WebGL, WebGPU, Unity, MonoGame
Machine Learning & Data: Convolutional Neural Networks (CNNs), TensorFlow, Scikit-learn, Data Preprocessing, Multi-threading

Key Projects

NeonSense - Game Development | *Unity* March. 2024 – Apr. 2024

- Contributed to a 3D cyberpunk-themed first-person shooter by implementing gameplay mechanics such as combat interactions and environmental interactions in a collaborative team setting.

Brawn Swan - Game Development | *Unity* Jan. 2024 – Feb. 2024

- Part of the mechanics & engineering team for a fighting beat-em-up game where you play as one angry swan. Implemented the gameplay mechanics such as punch, bite, ultimate slam, etc.

3D Scene Rendering with PBRT | *PBRT-v3* April. 2024

- Developed a 3D scene using physically-based rendering (PBRT) techniques, implementing bump mapping and environment mapping that resulted in photo-realistic images.

Real-time 3D Graphics | *WebGL, JavaScript, GLSL, HTML* Aug. 2023 – Dec. 2024

- Designed and implemented a real-time 3D renderer using WebGL, lighting, texture mapping, and environment mapping.

Mesh Subdivision | *Python* Nov. 2023

- Implemented Catmull-Clark subdivision to refine low-poly meshes, demonstrating expertise in computational geometry and mesh processing techniques.

B-spline Surface Generation | *Python* Oct. 2023

- Developed an algorithm for generating B-spline surfaces, demonstrating proficiency in computational geometry and surface modeling.

Spotify Playlist Generator | *Python, ElasticSearch, React* Jan. 2023 – April. 2023

- Built a personalized playlist recommendation system, using Elasticsearch and React for user interaction and algorithmic audio feature analysis.
- Specialized algorithm which considers various audio features such as danceability, energy, tempo, etc. for music recommendations.

Custom Interpreter using Recursive Descent Parsing | *C* Jan. 2023 – April. 2023

- Designed a recursive descent parser in C to create a custom interpreter that supports functional calls, recursion, and garbage collection.

Soccer Ball Object Tracking | *Python, OpenCV* April 2023

- Used mean-shift object tracking for real-time tracking of soccer balls, implementing computer vision techniques to identify player actions.

TLOZ 1986 - Game Development | *C#, MonoGame* Sep. 2022 – Dec. 2022

- Recreated the first dungeon from The Legend of Zelda (1986) using MonoGame, incorporating gameplay mechanics and design patterns like singleton and factory.

Space Invaders | *C* Jan. 2022 – March. 2022

- Developed a 2D Space Invaders minigame in C, featuring object collision, movement, and game logic.

Zero-Crossing Counter | *x86 Assembly* April. 2022

- Designed an x86 Assembly program to count zero-crossings and calculate energy in analog signals for speech recognition.

Convolutional Neural Network Image Classification | *Python, Scikit-learn, Tensorflow* April. 2022

- Built a CNN model to classify images from the CIFAR-10 dataset, achieving 75% accuracy and improving machine learning proficiency.

Virtual Store Database | *SQL* Aug. 2021 – Dec. 2021

- Contributed to the design of a SQL-based virtual store, writing advanced queries to support e- commerce operations.