John Eastman

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EDUCATION

Massachusetts Institute of Technology — **Cambridge, MA**

Master of Engineering in Electrical Engineering and Computer Science — Sept. 2024

- Concentrations in Artificial Intelligence and Computer Graphics — GPA: 5.0/5.0
- Notable Courses: Advances in Computer Vision, Machine Learning for Inverse Graphics, Computational Design and Fabrication, Shape Analysis, Advanced Computational Photography.

Bachelor of Science in Computer Science and Engineering — June 2023

- Minor in Japanese — GPA: 4.7/5.0
- Notable Courses: Intro to Machine Learning, Computer Graphics, Design and Analysis of Algorithms, Operating System Engineering, Computer Systems Engineering, Software Construction.

EXPERIENCE

MIT Electrical Engineering and Computer Science Dept. — **Cambridge, MA**

Graduate Teaching Assistant — Sept. 2023 – Dec. 2023

Undergraduate Teaching Assistant — Sept. 2022 – Dec. 2022

- Served as a TA for the Advanced Undergraduate Subject: Computer Graphics (6.4400) in Fall ’22 and Fall ‘23.
- Conducted office hours, assisted students with and graded C++ OpenGL coursework, and graded exams.

Second Front Systems — **Remote**

Data Science Intern — July 2023 – Aug. 2023

- Engineered Dash and Plotly dashboards with dynamic filtering and pagination for real-time data visualization.
- Implemented regression models for advanced trend analysis and future performance prediction.
- Structured the Python codebase for modularity and Docker deployment.

MIT Computer Science and Artificial Intelligence Laboratory — **Cambridge, MA**

Undergraduate Researcher - Computational Design and Fabrication Group — Feb. 2023 – Aug. 2023

- Collaborated with a multidisciplinary team to develop a rigid body physics simulation for underwater gliders.
- Implemented differentiable hydrodynamic forces, including lift and drag, as well as changes in mass into Nvidia’s differentiable simulation Python framework “Warp”, utilizing CUDA acceleration.
- Optimized glider hull design using gradient descent on differentiated forces with respect to glider shape.
- Enabled glider to optimize controls for faster horizontal speed or faster vertical descent.

Intel Corporation — **Remote**

3D Acceleration Software Engineer Intern — May 2022 – Aug. 2022

- Developed discrete GPU driver updates in C++ to resolve bugs and enhance Direct3D performance.
- Performed in-depth GPU performance profiling and analysis utilizing advanced analysis tools.
- Engaged with modern DirectX9, DirectX11, and DirectX12 3D titles in Windows.
- Provided technical support to developers using GPU systems for performance analysis.

PROJECTS

Tiny Light Field Network for Efficient 3D Scene Rendering

- Developed a compact version of a Light Field Network (LFN) in Python using novel deep learning methods to efficiently synthesize 3D scenes from 2D data.
- Utilized a RELU hypernetwork to optimize scene reconstruction and novel view synthesis.

Mesh Simplification for Accelerated Physics Simulation

- Engineered Garland-Heckbert mesh decimation and Van Gelder volume decimation algorithms in C++.
- Integrated Finite Element Method (FEM) for non-linear physics simulation on simplified meshes.
- Implemented Biharmonic weights to project simulated deformation from simplified mesh to the original mesh.

Improved Loss Function for Frame Recurrent Video Super Resolution

- Augmented original implementation of FRVSR model in Python using PyTorch and retrained it.
- Developed novel loss function, leveraging Perceptual Loss using VGG19 model to improve visual quality.

SKILLS

Programming Languages: C++, C, Python, C#, Java, Julia, MATLAB

Frameworks: PyTorch, NeRF, Direct3D (DirectX), OpenGL, Blender, UNIX, Unity Engine, Arduino, ESP32

Proficiencies: Machine Learning, Deep Learning, Computer Vision, Computer Graphics, Data Science