

Yaoshen Yuan

Senior PhD candidate with concentrations in programming, GPU acceleration and image processing. Have internship experience involving all cycles of software development and ability to work under high pressure. Expected to graduate in June 2021 and seeking for a full-time position for software engineer.

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Experiences

Software Engineer Intern, MathWorks

May. 2020 - Aug. 2020

Embedded Halide coder using C++

- Developed an embedded Halide coder prototype for MATLAB that can generate Halide code from MATLAB and decouple algorithm optimizations from the computer platforms.
- Expanded the set of Halide-compatible operations in MATLAB to cover over 70% Halide operations.
- Achieved over 10× speedup in key image processing benchmarks using auto-scheduler in the Halide coder prototype across multiple platforms.
- Proved the concept of using embedded Halide coder in MATLAB to significantly reduce the cost of algorithm optimizations across heterogeneous platforms for Embedded Coder teams.

Research Assistant, COTI lab, Northeastern University

Sep. 2016 - Present

Monte Carlo light modeling software – Monte Carlo eXtreme (MCX)

- Integrated new features with highly efficient C-language algorithms into MCX software to solve the challenge of light modeling in extremely complex tissues.
- Reduced the mesh complexity of realistic microvascular networks by over 200-fold and achieved 300% speed improvement when compared to the original version.
- Developed a graphic processing unit (GPU) version for the features using OpenCL to further achieve hundreds-fold speedup.
- Provided a unique solution for thousands of global researchers experiencing the lack of efficient tools for accurate light modeling for multi-scale biomedical imaging.

3-D GPU-accelerated adaptive nonlocal means (ANLM) filter toolbox

- Maximized the speed of memory-demanding ANLM filter using GPU to efficiently suppress stochastic noise in Monte Carlo light modeling images.
- Optimized shared memory utility and streamlined multiple filtering processes to reduce the read/write operations by 3.5-fold.
- Achieved 3 to 4× speedup compared to the state-of-art multi-thread CPU filter.
- Supported a wide range of applications in light modeling and medical imaging through online forum and annual workshops.

Researcher, Tufts University

May. 2015 - May. 2016

CT imaging enhancement for baggage scanning

- Established an enhanced CT reconstruction algorithm to tackle the challenge of low-quality imaging for objects with metal.
- Demonstrated to commercial CT manufacturers with results showing 20 dB signal-to-noise ratio improvement in simulations.

Education

Ph. D candidate in Electrical and Computer Engineering

Expected Jun. 2021

Northeastern University, Boston, MA | GPA: 3.87/4.0

M.S. in Electrical and Computer Engineering

Sep. 2014 - May. 2016

Tufts University, Medford, MA | GPA: 3.76/4.0

B.S. in Electrical and Computer Engineering

Sep. 2010 - Jun. 2014

Southeast University, Nanjing, China | GPA: 83.3/100

Skills

Language: Java, C, C++, CUDA, Python, MATLAB, Fortran

Knowledge: software development, data structure, algorithm, object-oriented design, GPU acceleration, image processing

Graduate courses: data structure, algorithm, computer engineering, database, intro to machine learning, computer vision

Certifications/Honors

- Convolutional Neural Networks (Coursera)
- Neural Network and Deep Learning (Coursera)
- Software patent of China (2015SR137375)
- Second Prize in Electronic Design Competition, Southeast University