

Xu Liu

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Profile

Familiar with data structures and algorithms.
Familiar with procedure, object oriented, functional programming,
Familiar with principles of operating system, networks and database,
Familiar with GPU/OpenGL/WebGL/CUDA,
Strong passion for programming and learning new technologies,

Skills

C/C++/Java/Python/Scheme/ML, HTML/CSS/JavaScript, OpenGL/WebGL/CUDA, SQL/MongoDB

Projects (github.com/liuxu1005 / liux1005.github.io)

JOS (Operating System, C, Assembly)

Implemented in C and assembly. It includes

1. Booting, loading OS to RAM, stack backtracking for debug,
2. Memory Management: allocate/free memory for page table, process control block and file directory,
3. Process Management: process scheduling, context switch, fork/spawn new process,
4. Inter-Process Communication with message and shared memory,
5. System Calls and Atomic Operation,
6. Seven-Layer File System,
7. Network Card Driver, Multi-thread Web Server.

Channel Code/Modulation/Demodulation/Routing (Network Protocol, Python, C++)

Implemented in Python. It includes

1. basic source coding and channel coding algorithms (data layer),
2. modulating and demodulating signals to medium (data layer),
3. medium access control (data layer),
4. routing algorithm (network layer),
5. transportation control algorithm (transport layer),
6. simple HTTP sever (application layer).

RPC Generator (Distributed System, C++)

Implemented in C. It Automatically generate RPC stubs for given IDL files;
is able to deal with recursively nested structure and array.

Sphere in Water (Computer Graphics, GPU, WebGL, JavaScript)

Implemented with CSS, Html, JavaScript and WebGL shader. It features
recursive ray tracing with reflections and refractions,
collision detection and response,
water wave simulation,
caustics simulation.

Triangulation/Monotonicity (Computational Geometry, Java)

Implemented with Java applet.
Three geometry algorithms including

detecting monotonicity in $O(n)$,
separating non-monotonic polygons into monotonic pieces in $O(n \log n)$,
triangulating the monotonic in $O(n)$.

[Content Centric Network Report](#) (Network Protocol)

Final paper for System Design class, discuss features of CCN network architecture.

[Sorting on CPU and GPU](#) (Computer Architecture, GPU, CUDA, C++)

Implemented with C++ and CUDA.

It compares performance on CPU and GPU of various sorting algorithms including merge sort, quick sort, radix sort, bitonic sort.

[KNN/Naive Bayes/Perceptron](#) (Machine Learning, Python)

Basic algorithms from Machine Learning, implemented with Python.

Courses

Computation Theory, Programming Languages, Discrete Mathematics, Algorithm, Data Structures
Artificial Intelligence, Machine Learning, Computational Geometry, Computer Graphics,
Advanced Computer Architecture, Machine Architecture and Assembly Language,
Database, Internet-scale Distributed System, Operating System, Networks

Education

Master of Computer Science (GPA 3.7/4.0)	Tufts University, US	Aug. 2016
Post-Baccalaureate Certificate (GPA 4.0/4.0)	Tufts University, US	June 2015
Master of Material Science	Southwest Jiaotong University, China	June 2008

Other Experiences

Application Engineer	Angstrom Advanced, Braintree MA	Mar. 2012 – Jan. 2015
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Technical support on application, installation & troubleshooting for chemical/material analysis instruments such as SEM, AFM/SFM, XRD, EDS/WDS, ICP-AES, GC-MS.

Lithograph/Intergrated Process Engineer	Shanghai, China	Feb. 2008 – Aug. 2010
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Develop and maintain processes for 6" silicon wafer production line.