# Xu Liu

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## Profile

Familiar with multiple programming paradigm: imperative, functional, object oriented, logic
Familiar with operating system, network layers, database and distributed system,
Familiar with general algorithms, basic algorithms of machine learning, geometry, graphics,
Familiar with machine architecture: CPU, SMP, GPU,
Strong passion for programming and learning new technologies,
Comfortable to teamed up with me.

## Skills

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

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

JOS (Operating System)
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, system calls,
5. Seven-Layer File System,
6. Network Card Driver, Multi-thread Web Server.

Channel Code/Modulation/Demodulation/Routing (Networks)
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 (System Design)
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)
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)
Implemented with Java applet.

Three geometry algorithms including
detecting monotonicity in O(n),
separating non-monotonic polygons into monotonic pieces in O(nlogn),
triangulating the monotonic in O(n).

Content Centric Network Report (System Design)
Final paper for System Design class, discuss features of CCN network architecture.

Sorting on CPU and GPU (Computer Architecture)
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)
Basic algorithms from Machine Learning.

## Courses

**From Tufts University:**

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, System Design

**Taught by self:**

Operating System (following MIT 6.828 Operating System Engineering)
Networks (following MIT 6.02 Digital Communication and 6.829 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
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
Develop and maintain processes for 6” silicon wafer production line.