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Lieyu Shi

Seeking software engineering intern for 2018 Summer
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Education

2014–2019 **Ph.D.** student in **Computer Science**, University of Houston, TX, USA
Research: Particle-based fluid simulation and analysis

July 2013 **Bachelor** of Science in **Computational Mathematics**, Xi'an Jiaotong University, China
Thesis: "Two-grid finite element algorithm for semi-linear elliptic equations"

Project

2017 **Unsupervised learning in flow visualization**

- Performed mainstream clustering for high-dimensional data with novel metrics by K-modoids, DBSCAN, OPTICS, BIRCH, spectral clustering, AHC and affinity propagation.
- Developed an extensible cmake-based C++ project accelerated with OpenMP in Linux environment through object-oriented designing and analyzing principles.
- Overcame out-of-memory restriction by data decomposition computing and streaming.
- Proposed an optimization-oriented clustering (revised k-means) for feature extraction.
- Used a BP neural network and PCA for clustering comparison of flow trajectories.

2016 **Sharding and replication implementation for online storage**

- Designed a simplified two-way online storage system with Java socket programming.
- Enabled backup and record of data information while downloading and uploading data.
- Used makefile to compile and run Java software on server with local library linkage.

2016 **Particle-based fluid simulation**

- Simulated large-scale scenarios with OpenMP-accelerated C++ project on Paraview.
- Designed a glui-library based GUI application for interactive visualization of high-dimensional flow data with OpenGL and GLSL in Linux environment.
- Improved rendering effect by applying texture mapping and light shading.
- Built GPU version for both simulation and visualization of this project.

2016 **Operating system course project**

- Implemented a client-server mode for file reading and writing operation by C++ socket programming among separate Linux machines.
- Applied POSIX multithreads and semaphores for a mutual-exclusion application.
- Designed a command language interpreter for input/output shell scripts.

Work Experience

2014–now Teaching Assistant for OOP Programming and Operating System
Provided tutorship for freshman on object-oriented programming C++ and Java (JavaSwing design), and juniors on operating system programming assignments (process management, shared memory and semaphore controlling, and virtual memory management).

Publication

2017/01 *Analysis-enhanced particle based flow visualization*, VDA 2017,
Lieyu Shi, Lei Zhang, Wei Cao, Guoning Chen

2017/08 *Metric-based curve clustering and feature extraction in flow visualization*, CAD&CG 2017,
Lieyu Shi, Guoning Chen

Courses

Graduate: Computer Architecture, Computer Network, Operating System, Machine Learning, Data Structure, Algorithm, Computer Graphics, Visualization, Numerical Analysis, Theory of Computation, Fundamental of Medical Imaging

Computer Skills

Intermediate: C++, C, Java, Matlab, R, Mathematics, latex, Paraview, OpenGL, GLSL, Linux
Basic: VTK, Cuda, Qt, CMake, Blender, OpenMP, Python, Tensorflow