

Haocheng Liu

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Education

Carnegie Mellon University

M.S. IN MECHANICAL ENGINEERING 3.8/4.0

Pittsburgh, PA

Aug. 2014 - May. 2016

- Graduate research assistant, Visual Design and Engineering Lab
- Teaching assistant, Artificial Intelligent and Machine Learning

Shanghai Jiao Tong University

B.S. IN MARINE ENGINEERING 3.7/4.0

Shanghai, China

Sep. 2010 - June. 2014

- Outstanding graduate of Shanghai Jiao Tong University

Experience

Kitware Inc.

R&D ENGINEER

Clifton Park, NY

Jun. 2016 - Now

- **Simulation Modeling ToolKit and Computational Model Builder framework**
 - Architected a reactor modeling tool kit which provided a front end UI to design and visualize complicated model via Qt and GPU glyphing, adding C++ python binding support and ability to launch parallel meshing jobs with Cubit
 - Created a meteorological geo-data browser which allow users to fetch data asynchronously from remote servers and analyze them on real world map via OpenStreetMap RESTful API and MVVM design pattern
 - Implemented data IO serialization via nlohmann_json and several geometry deformation algorithms such as terrain extraction, bathymetry, etc
 - Created a singleton model manager which bridged the modeling server and visualization client
- **Scientific visualization algorithms for Massively Threaded Architectures toolkit(VTK-m)**
 - Implemented a bunch of parallel scientific algorithms(split shape edge, probe, etc) and improved the shared memory support for CUDA and runtime selection for TBB and OpenMP
 - Simplified the testing infrastructure which is capable of parsing runtime arguments and saving runtime overheads by CRTP pattern and generic programming. It reduced the binary size by 80% and improved 40% of runtime performance
 - Refactored the code base with C++11 features which simplified meta programming, improving runtime overhead as well as adding a reliable random number generation and prepare for C++14 migration
 - Added an address sanitizer nightly build which automatically reported memory errors to a remote dashboard
- **Adaptable Input Output System Version 2(ADIOS2)**
 - Implemented a parallel data reader which could distribute and balance loads among many processes and visualize streaming data, in-situ data in large scale
 - Parallelized the engine tests(BP, HDF5, ADIOS1, etc) and binding tests(Python, Fortran)
 - Extended FindGoogleTesting CMake module so that it can launch MPI tests and provide a better CMake integration

Skills

DevOps Linux, Windows, Multi threading, Meta programming, Docker, GDB, Vagrant, AWS

Framework Qt, Google Testing, Visual Studio, Spack, Ansys APDL

Software CUDA, OpenMP, Meshlab, nlohmann_json, TBB, OpenStreetMap, Pybind11

Open source VTK, ParaView, SMTK, CMB, ADIOS2, Spack, CMake, Raspberry Pi

Programming C++, CMake, Python, Git, Bash, LaTeX, Java, Fortran