

Haixiang Liu

(608) 320 6837

cs.lhxac@gmail.com

EDUCATION

Ph.D. in Computer Sciences

2012-Present

University of Wisconsin - Madison

Area of Research - High efficiency Numerical Solvers for Large Scale Sparse Linear Systems.

Minor in Mechanical Engineering

BSc. Computer Science and Applied Mathematics

2007-2011

Hong Kong University of Science and Technology

WORK EXPERIENCE

Research Intern

2016 Summer

Disney Animation Studio, Internship

Developed an adaptive FEM simulation framework for animation production pipeline

SELECTED CLASSES

Intermediate Fluid Dynamics

Automatic Controls Lab

Nonlinear Optimization

Theory of Elasticity

Advanced Machine Learning

FE for Biomechanics

Finite Elements

Adv Computer Architecture

Computer Animation

RESEARCH PROJECTS

A scalable Schur-complement fluids solver for heterogeneous compute platforms

Developed a domain decomposition method for solving large scale poisson problem utilizing multi-accelerators(GPU,Intel PHI) platforms by minimizing the communication across PCI-E. 2014-2016

Power Diagrams and Sparse Paged Grids for High Resolution Adaptive Liquids

Developed a second-order accurate adaptive free surface fluid simulator. Contributions includes: an high resolution level set tracking and advection scheme; fast marching on octree; 2nd order poisson discretization and solver for adaptive grid using power diagram. 2016-2017

Narrow-Band Topology Optimization on a Sparsely Populated Grid

Developed an efficient Multigrid precondition conjugate gradient solver using SIMD instructions which enables billion degrees of freedom topology optimization. 2017-2018

Stencil Aware Multigrid Method for Linear Elasticity

Improved the convergence of the geometric multigrid method for linear elasticity by introducing additional auxiliary variables. 2018

Hierarchical Direct Solver For Cartesian Grid Discretization

Developed a hierarchical direct solver using Schur-complement method that requires significant less memory than other direct solvers, s.t PARDISO. 2018

SPGrid Plugin for Renderman™

Developed SPGrid levelset and volume rendering plugin for Renderman™ 2016-2018

SKILLS

Languages

Chinese (native tongue),English (fluent)

Programming

C++, CUDA, JAVA, MATLAB, GLSL, Intel Intrinsics, MPI, OpenMP

Softwares

Blender, Renderman, PARDISO, Unity3D

Education

Fluid Dynamics, Continuum Mechanics, Finite Element Method

Multigrid Method, Linear Algebra, Numerical Solvers

REFERENCES

Eftychios Sifakis (Acedemic Advisor)

University of Wisconsin Madison

sifakis@cs.wisc.edu