

FEI ZHU

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R&D INTERESTS

Computer Graphics

Area of Expertise

Physically-based Simulation and Rendering

Computer Vision and Speech

EDUCATION

Peking University

September 2010 - July 2015

Ph.D. in Computer Science

Thesis: Fast and Directable Simulation of Complex Deformable Materials

Xi'an Jiaotong University

September 2006 - July 2010

B.E. in Computer Science

Thesis: Research on GPU-friendly Mesh Refinement Algorithms

EXPERIENCE

Senior Research Engineer, GraphicChina Co.,Ltd

July 2015 - present

Lead the research team. Devise, plan and execute research and software projects for production needs.

- **Led the design and development of proprietary cloth simulation system.** The system is capable of simulating virtual garments with high realism in real-time. I am responsible for the architecture design, new feature development, performance optimization, and maintenance of the system.
- **Designed and developed the Seaming&Hemming system.** I proposed a series of algorithms that can generate highly-realistic seams and hems for virtual garments. I also designed and developed the software system. The algorithms and corresponding software are one of its kind in industry.
- **Designed and developed the Garment Transfer system.** The system is designed to transfer fitted virtual garments between human models of different shapes and poses. The system that I developed significantly accelerated the massive production of virtual garments.
- **Designed and developed the Layer-based Collision handling system.** I proposed an algorithm to address the issue of self-collision for multi-layered virtual garments. The algorithm significantly outperforms naive collision algorithms that do not take advantage of garment layer information.
- **Designed and developed the Embedded Mesh system.** It is a novel technique in which the computational mesh is a hybrid of surface and volumetric representations. The technique could be used to preserve the carefully-tuned details of garments during simulations. It is also useful for real-time virtual try-on applications.
- **Led the algorithm design of the Texture Sewing system.** The texture of a well-tailored garment is smooth and seamless across cloth pieces. I led the algorithm design of a system that can achieve this goal on virtual garments. We manipulate the texture coordinates of cloth meshes, and the result texture is visually seamless.
- **Led the design and development of proprietary fur modeling system.** The system is designed to model furs with varied shapes and styles. The generated furs could be synthesized with the garment meshes to produce realistic appearance of virtual garments that are made of furs.
- **Designed early prototype of the Made-to-Measure system.** The made-to-measure system is designed to automatically alter 2D patterns of a garment according to the measurements of a specific customer. I led the algorithm design of an early prototype of the system.

Graduate Research Assistant, Peking University

September 2010 - July 2015

Conduct research in computer graphics, publish papers, and develop research software systems.

- **Explored the frontier of research in physically-based simulation.** The areas covered include the computational simulation of deformable materials, fracture, fluids. The research led to the publication of several peer-reviewed papers.
- **Studied and conducted research in general aspects of computer graphics.** I was a code contributor of the Peking University Modeling system (PUM) and the Multi-View Reconstruction system (2-3D View). The research and system development was focused on mesh reconstruction, smoothing, simplification, and editing.

Visiting Researcher, University of California, Los Angeles

September 2013 - December 2013

Conduct collaborative research with Prof. Joseph Teran.

- **Worked on a hair simulation project.** We proposed a novel algorithm for hair simulation, which is a hybrid of the mass-spring system and the material point method. The issue of hair collision is well-addressed using the grid of the material point method.

Open Source Developer

July 2010 - present

Share personal code: <http://github.com/FeiZhu>

- **Physika: a versatile physics simulation library.** I am the creator and major code contributor of this multi-physics simulation library. Simulation of deformable solids and rigid bodies are currently supported. I update the library in my spare time.
- **QMesh: a 3D mesh viewer that runs on iOS devices.** QMesh allows the user to manipulate 3D models on iOS devices with their fingers: translation, rotation, and zoom. It supports multiple view modes and shading modes, and also supports materials and textures.

PUBLICATIONS

Jing Zhao, **Fei Zhu**, Yong Tang, Liyou Xu, Sheng Li, Guoping Wang: “**Real-time Example-based Materials in Laplace-Beltrami Shape Space**”, The International Conference on Computer Animation and Social Agents, 2017.

WeiChen*, **Fei Zhu***, Jing Zhao, Sheng Li, Guoping Wang: “**Peridynamics-Based Fracture Animation for Elastoplastic Solids**”, Computer Graphics Forum, 2017. (* indicates equal contributions)

Fei Zhu, Jing Zhao, Sheng Li, Yong Tang, Guoping Wang: “**Dynamically Enriched MPM for Invertible Elasticity**”, Computer Graphics Forum, 2016.

Fei Zhu, Sheng Li, Guoping Wang: “**Example-based Materials in Laplace-Beltrami Shape Space**”, Computer Graphics Forum, 2015.

Ning Liu, **Fei Zhu**, Sheng Li, Guoping Wang: “**Anisotropic Kernels for Meshless Elastic Solids**”, The International Conference on Computer-Aided Design and Computer Graphics, 2011.

SKILLS

Expertise: computational simulation, numerical algorithms, advanced linear algebra, classical mechanics, Object Oriented Programming, software designing, developing, and debugging

Programming Languages Fluent: C/C++. Familiar: CUDA, Python, Objective-C.

Tools Microsoft Visual Studio, GCC/G++, Git, SVN, Scons, Emacs, etc.

Platforms Windows, Linux, Mac OS X.

HONORS

President Scholarship, Peking University, 2010 - 2015 (**100 of all Ph.D. students**, university-wide)

Founder Scholarship, Peking University, 2011

Outstanding Graduate, Xi'an Jiaotong University, 2010

National Encouragement Scholarship, 2008 - 2009

EASTCOM Scholarship, Xi'an Jiaotong University, 2007

SiYuan Scholarship, Xi'an Jiaotong University, 2006