Dr. Yili Zhao

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Education

University of Southern California, Los Angeles, CA
Ph.D. in Computer Science, August 2009 - August 2014
Dissertation Title: *Plant Substructuring and Real-time Simulation Using Model Reduction*
Committee: Jernej Barbič (advisor), Gaurav S. Sukhatme, Ulrich Neumann, Igor Kukavica, Stefan Schaal

Peking University, Beijing, China
M.S. in Computer Science, September 2006 - July 2009
Thesis Title: *Acceleration Techniques in Rendering Large-scale and Complex Scenes*

Nanjing University of Aeronautics and Astronautics, Nanjing, Jiangsu, China
B.S. in Computer Science, September 2002 - June 2006 (Ranked **2^{nd} out of 268**)
Thesis Title: *Research on Segmentation of three-dimensional Meshes with Color and Texture*

Visa Status

H-1B: H-1B visa began on October 1, 2015;

Working Experience

Facebook Menlo Park, CA
Research Scientist, March 2015 - present

- Design and develop the Facebook ads ranking system, which significantly boost prediction accuracy, ads quality, and company revenue. I designed and implemented scalable, reliable and parallel algorithms to speed up the prediction process, lower the query latency, memory usage, system workload etc., and improve the ranking precision, and ads quality. I also built and optimized the feed ads ranking models, quality models by mixing several techniques such as probability theory, numerical optimization, machine learning, signal processing, feature engineering etc.
- Design and develop Facebook ads backend infrastructure that ingests billions of user events in real-time, and transform them into denormalized, flat data, ready for the immediate use in Facebook machine-learning system.

Oculus, Facebook Menlo Park, CA
Research Scientist, December 2014 - March 2015

- Designed and developed a system to construct and optimize geometric models of human hands from the sampled data.

Nimble VR (acquired by Facebook), San Francisco, CA
Research Engineer, October 2014 - November 2014

- Designed and developed visualization tools to analyze the recognition rates of the hand tracking system.

Research Experience

University of Southern California, Los Angeles, CA
Graduate Research Assistant, advisor: Jernej Barbič, August 2010 - August 2014

- **Developed a robust system to convert plant "polygon soup" triangle meshes into non-linear FEM mechanical models suitable for physically based simulation.** Published at ACM SIGGRAPH 2013. I delivered the 20-minute SIGGRAPH presentation.

- **Developed a real-time system for simulation of anatomically realistic plants (trees, flowers, bushes, forests, etc.).** See Figure 1. Published at ACM SIGGRAPH 2011.
  Video 1: Oregon White Oak, realistic anatomy, adult tree, 120,000 leaves
  Video 2: Real-time physically-based simulation of plants
- **Developed an algorithm to simulate time-varying, geometrically complex, penalty-based distributed contact between many rigid objects and articulated objects.** Published at IEEE Transactions on Visualization and Computer Graphics.
  Video: Implicit Multibody Penalty-based Distributed Contact

- **Code contributor to Vega FEM library**, a computationally efficient and stable C/C++ physics library for three-dimensional deformable object simulation.

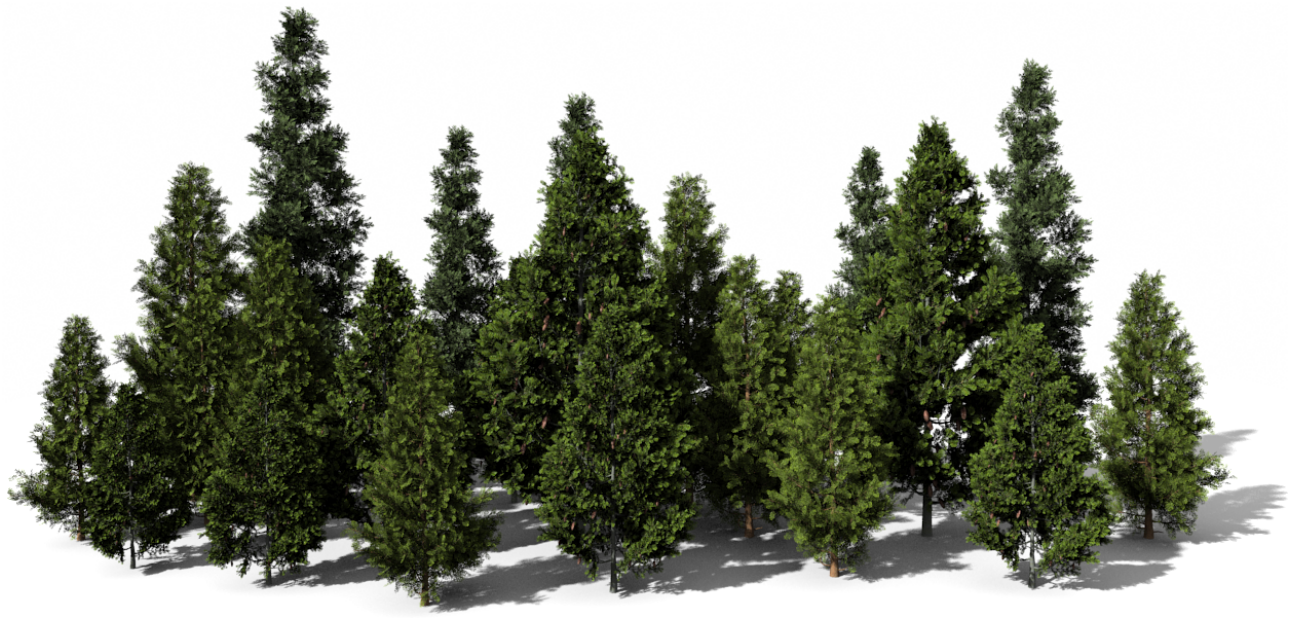

Figure 1: Simulating forest in randomized wind: 3 species, **24** trees, **1,920,525** triangles, **180,795** domains, **139,418** reduced DOFs, simulation fps: **3** Hz. **[video]**

University of Southern California, Los Angeles, CA
Graduate Research Assistant, advisor: Suya You, August 2009 - May 2010

- Developed an **augmented reality** system that allows user to virtually walk in a **large-scale** and **complex scene** with many textured three-dimensional building models.

Peking University, Beijing, China
Graduate Research Assistant, advisor: Guoping Wang, September 2006 - July 2009

- Developed algorithms to accelerate rendering of a **large-scale, complex** scene with many three-dimensional massive models (funded by China National High-tech Research and Development Program).
- Developed algorithms to detect and repair the irregularities on three-dimensional triangle meshes (funded by National Grand Fundamental Research Program of China).

Nanjing University of Aeronautics and Astronautics, Nanjing, Jiangsu, China
Undergraduate Research Assistant, advisor: Songcan Chen, Liyan Zhang, September 2005 - June 2006

- Developed an algorithm based on quadric error metrics to segment three-dimensional triangle meshes with color and texture properties.

Publications

Hongyi Xu*, **Yili Zhao***, Jernej Barbič: "**Implicit Multibody Penalty-based Distributed Contact.**" IEEE Transactions on Visualization and Computer Graphics, Vol. 20(9), 2014 (*** joint first authors**)

Yili Zhao and Jernej Barbič. "**Interactive authoring of simulation-ready plants.**" *ACM Transactions on Graphics*, Vol. 32, No. 4, (SIGGRAPH 2013) (July 2013)

Jernej Barbič and **Yili Zhao**. "**Real-time large-deformation substructuring.**" *ACM Transactions on Graphics*, Vol. 30, No. 4, (SIGGRAPH 2011) (July 2011)

Skills

Strong research & programming experience in numerical optimization, computer graphics, animation, simulation, machine learning and math.

Solid experience in designing, developing, and debugging software, written mostly in C++, using state-of-the-art algorithms and procedures.

Solid knowledge of calculus, advanced linear algebra, classical mechanics, Finite Element Method, robotics, numerical methods, Object Oriented Programming, C/C++ advanced concepts (polymorphism, virtual inheritance, etc.), C++11, computer architecture, parallel programming.

Languages: C/C++ (since 2002), Python, Presto, HiveQL, LaTeX, HTML;

Tools: vi, gcc, Makefiles (Linux), git, OpenMP, OpenGL, GLUT, Intel MKL library, wxWidgets, GLUI, gnuplot, Subversion, yafaray (raytracing engine).

Software: MS Visual Studio, MATLAB, Autodesk Maya, Adobe Photoshop, Adobe Illustrator, Adobe After Effects.

Platforms: Mac OS X, Linux, Windows. All three used on a regular basis.

Honors and Awards

Best Poster for Visual Presentation, Department of Computer Science, USC, 2012, 2013

Chiang Chen Scholarship, Peking University, 2006 (**1 of 20** winners, university-wide)

Excellent Graduate 2006, NUAA, June 2006 (**top 1%**)

Bronze medal, the 29^{th} ACM International Collegiate Programming Contest (Hangzhou site, 2005)

Member of Outstanding Student Program, NUAA, An elite subset of University Undergraduate Program, 2003 - 2004 (Ranked $\mathbf{2^{nd}}$ **out of 32**)

Excellent Student Scholarship, $\mathbf{1^{st}}$ **Prize** , NUAA, 2003 - 2006 (Consecutive **4** years, **top 2%**)

Paper Reviews

- SIGGRAPH 2016
- SIGGRAPH Asia 2015, 2016
- Eurographics 2017
- Pacific Graphics 2014, 2015, 2016
- Graphical Models 2016
- Neurocomputing 2016
- Computers & Graphics 2013

Personal

I like swimming, free style. I swim 1 mile (nonstop) every day in USC Daland's Swim Stadium.

References

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