

LIFAN WU

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EDUCATION

University of California, San Diego, La Jolla, CA

Sept. 2015 - present

PhD student in CSE Department

Advisor: **Prof. Ravi Ramamoorthi**

GPA: 3.9/4.0

Tsinghua University, Beijing, China

Aug. 2011 - Jul. 2015

B.Eng. in Computer Science & Technology

Institute for Interdisciplinary Information Sciences

Special Pilot Computer Science Class (**Yao Class**)

GPA: 90/100

RESEARCH EXPERIENCES

Multiple Axis-Aligned Filters for Rendering of Combined Distribution Effects Jan. 2016 - Mar. 2017

Research Assistant

Center for Visual Computing, UCSD

- Developed *multiple axis-aligned filters* (MAAF) for near-interactive rendering of combined distribution effects, including soft shadows and depth of field, with global illumination.
- We analyzed MAAF for 2D wedge spectra in the frequency domain, and showed that MAAF achieved better performance comparing to previous methods.
- We designed practical algorithms for rendering with MAAF and implemented in a modern GPU rendering framework.

Downsampling Scattering Parameters for Rendering Anisotropic Media Nov. 2015 - May 2016

Research Assistant

Center for Visual Computing, UCSD

- Introduced *scaled phase functions* combining albedos and phase functions.
- Developed an optimization based method to *downsample* scaled phase functions, which can offer several orders of magnitude reduction in storage while maintaining appearance accuracy.
- Showed how *modularity* can be exploited by reusing a single set of optimized parameters for multiple objects, significantly reducing the amortized optimization overhead.

Interactive Surface Reconstruction on Point Clouds

Jul. 2014 - Jul. 2015

Visiting Undergraduate Researcher

Washington University in St. Louis

- Built an interactive tool to help users draw sketches and reconstruct surfaces on point clouds.
- Designed a novel anisotropic tensor-based metric to capture sharp features of a point cloud model.
- Proposed an optimization algorithm to regularize the curve network drawn by users.
- Extended our algorithm for interactive point cloud segmentation.

Intermediate Path Tracing and Merging

Sept. 2013 - Jun. 2015

Research Assistant

Graphics and Geometry Computing Group, Tsinghua University

- Introduced *intermediate paths* and *path merging graph* to increase path samples exponentially.
- Designed and implemented the key algorithm of iterative path merging via *path merging graph*.
- Proposed the Multiple Importance Sampling (MIS) technique to combine an exponential number of path samples by introducing partial weights of subpaths.

Anisotropic Density Estimation For Photon Mapping

Mar. 2014 - Jun. 2014

Research Assistant

Graphics and Geometry Computing Group, Tsinghua University

- We proposed an anisotropic filtering kernel for density estimation, which considers the anisotropic BRDFs on the eye path.
- Discussed and proofread the derivation of the anisotropic kernel, based on gradient of Anisotropic Spherical Gaussians.
- Investigated related works about photon density estimation, and wrote several sections of our paper.

INTERNSHIPS

Disney Research Zurich

June 2017 - Sept. 2017

Google

June 2016 - Sept. 2016

PUBLICATION

Multiple Axis-Aligned Filters for Rendering of Combined Distribution Effects

Lifan Wu, **Ling-Qi Yan**, Alexandr Kuznetsov, **Ravi Ramamoorthi**

Computer Graphics Forum (EGSR 2017), 36(4), June 2017

Downsampling Scattering Parameters for Rendering Anisotropic Media

Shuang Zhao*, **Lifan Wu***, **Frédéric Durand**, **Ravi Ramamoorthi** (* Joint first authors)

ACM Transactions on Graphics (SIGGRAPH Asia 2016), 35(6), November 2016

Anisotropic Density Estimation for Photon Mapping

Fujun Luan, **Lifan Wu**, **Kun Xu**

IEEE Journal of Computational Visual Media, September 2015

HONORS AND AWARDS

Professional Excellence Scholarship, Tsinghua University

2014

Tsinghua-Baidu Scholarship, Tsinghua University

2013

Fellowship of Tsinghua Xuetang Talents Program, Tsinghua University

2012 - present

Among top 300 / 3000 Tsinghua students each year.

Silver Medal, Chinese National Olympiad in Informatics

Aug. 2010

Gold Medal, Asia-Pacific Informatics Olympiad

May 2010

Ranked 2nd place out of 350 contestants.

SKILLS

Programming Languages

C/C++, Python, Matlab, Java, Ruby

Systems

Windows, Linux, OS X

Softwares & Applications

Mitsuba, OptiX, PBRT, CUDA, OpenGL, OpenCV, L^AT_EX, CMake