LIFAN WU

Tel: (+1)858-531-9383 ⋄ Email: winmad.wlf@gmail.com

Homepage: http://winmad.github.io

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 interative 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 Sperical 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***, Frédo 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 - 2015
        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, LaTeX, CMake