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

University of California, San Diego, La Jolla, CA Sept. 2015 - June 2018
MS in Computer Science
Computer Science & Engineering Department

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)

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

INTERNSHIPS

NVIDIA Research, real-time rendering group June 2018 - Sept. 2018
Disney Research Zurich, rendering group June 2017 - Sept. 2017
Google, map group June 2016 - Sept. 2016

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.

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
Softwares & Applications Mitsuba, PyTorch, TensorFlow, OptiX, PBRT, CUDA