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: 4.0/4.0

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

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.

PUBLICATION

Downsampling Scattering Parameters for Rendering Anisotropic Media
Shuang Zhao*, **Lifan Wu***, Frédo Durand, and 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**, and Kun Xu
IEEE Journal of Computational Visual Media, September 2015

COURSE PROJECTS

Global Illumination and Physically Based Light Transport   Mar. 2013 - Aug. 2013
Students Research Training

· Investigated most of the global illumination algorithms, including path tracing, photon mapping, light-cuts, VCM and their variations.
· Built a renderer from scratch and integrated several global illumination algorithms.

Content-Aware Image Resizing   Dec. 2012
Course: General Computer Science

· Reproduced an adaptive image resizing algorithm, based on SIGGRAPH 2007 paper *Seam Carving for Content-Aware Image Resizing.*
· Extended seam carving algorithm to remove objects via user interactions.

Mesh Simplification   Jun. 2012
Course: Fundamentals of Computer Graphics

· Implemented a mesh simplification algorithm that can produce simplified triangular meshes with high quality.
· Used quadratic error metric for accuracy and efficiency.

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++, Matlab, Python, Java, Ruby
Systems	Windows, Linux, OS X
Softwares & Applications	Mitsuba, PBRT, OpenGL, OpenCV, LaTeX, CMake