Yuguang Li

402, Paul Allen Center
185 West Stevens Way Northeast, Seattle, WA 98195

Cell Phone: 315-897-7889
Email: ylee3@cs.washington.edu

EDUCATION

Master of Science (Also in second-year PhD Program): University of Washington
Major: Electrical Engineering (Computer Vision) working in UW CSE since September 2014
Advisor: Linda Shapiro

Master of Science: State University of New York College of Environmental Science & Forestry (2014)
Major: Geospatial Information Science & Remote Sensing

Bachelor of Engineering: Beijing University of Aeronautics & Astronautics (Beihang Univ.) (2012)
Major: Electrical Engineering (Remote Sensing)

PROGRAMMING SKILLS

Proficient in **C++**, **Python** and **C**. Most of my code are written with **OpenCV** (C++ and python), **OpenGL(GLSL)**, **Halide**, **Qt** and **Caffe**.

Keywords: Computer Vision, Computer Graphics, Machine Learning, Deep Learning, Parallel Computation (Halide, GLSL), Image Processing, Artificial Intelligence, Geospatial Information System, Embedded System

WORK EXPERIENCE

- **Software Engineer Intern: Creative Technology Lab, Adobe Research**
  6/2016 -- present
  Mentor: Eric Stollnitz
- **Research Assistance (RA) in Department of Computer Science and Engineering, University of Washington**
  12/2014 – present
  Mentor: Linda Shapiro
- **Research Assistance (RA) in SUNY**
  08/2012– 05/2014

PROJECTS & RESEARCH EXPERIENCE

- **Adobe Intern Project**: **Cross-platform Halide-based Image Processing Pipeline (Computer Graphics & GPU)**
  Objective: I built a Halide-based cross-platform fast image processing solution to simplify hardware acceleration coding in image processing. Meanwhile I helped improve the Halide library with OpenGL. With OpenGL Halide(C++), GPU and CPU image processing programs could be easily accelerated from scheduling. Meanwhile, Halide compiles them on all kind of hardware platforms, iOS, Android, windows, CPU PC, etc. Photoshop Express and Aviary have already been using our solution in their products.

- **ICPR 2016 Face Detection Challenge** (Results is soon going to be published in CVPR workshop)
  03/2016-04/2016
  Objective: We (me and another UW student) built a pipeline in the ICPR 2016 face detection challenge to detect and classify faces in the wild. The contest datasets include faces with different color contrast, rotation and distortion. Our classifier eventually labels the images with gender and facial expression. The overall accuracy of predicting gender and facial expressions are 81% and 89%. Our team won the fifth place among 50 participating teams.

- **Zooplankton recognition using deep learning neural network (Computer Vision)**
  01/2016 – Present
  Objective: In this project, I'm classifying grayscale images of plankton. I'm developing a rotation and scale invariant deep learning convolution neural network model, which combines different handcrafted color and texture features to classify different species and their different phase. Image patches are fine-grinned classified with hierarchical classification architecture. The challenge here is to accurately classify the animals, such as shrimps, in different gesture and viewing angles.

- **Fast mitosis couting from histopathological images using deep learning neural network (Computer Vision)**
  12/2014 – Present

Objective: In this project, I invented a fast mitosis detection pipeline applied to histopathological images. The proposed method is similar to RCNN, where regional proposal is created by pixel-wise classification using a random forest classifier. Image patches are then classified by multi-column convolutional neural network. It was trained with different datasets, where pre-processing and data augmentation were applied. The proposed method achieved an average 500 times speedup compared with the traditional scanning window technique. In the meantime, we discovered new handcrafted image features which helps with mitosis detection.
Advisor: Linda Shapiro

- **Multi-view Environmental Matting (Raw sensor image data analysis & Graphics)**
  10/2015-12/2015
  Objective: Matting and compositing a reflective/refractive object into a new environment and make it look realistic from different perspectives is an interesting generalization of traditional greenscreen matting.
  Web Page: http://homes.cs.washington.edu/~ylee3/EnviMatting/EnviMatting.html
  Advisor: Brain Curless

- Course Project: **Animator and Ray-tracer Implementation with OpenGL** (CSE 557 Computer Graphics)

- **A Hybrid Iterative Optimization Method to Fit Gaussian Mixture and Analyze LiDAR Full Waveforms** (Paper plans to be submitted to the journal IEEE Transaction on Geoscience and Remote Sensing)
  12/2013 – 05/2014
  Objective: Improve regression accuracy and algorithm efficiency of the existing Gaussian mixture fitting method. Apply this model in decomposing Lidar full waveform signal.

- **Fast Photon-Mapping based Large Scale Ray-tracing Simulation (Ray-Tracing)**
  07/2012 – 01/2014
  *Objective: Designed a large-scale **photon-mapping (Ray-tracing)** based sensor simulation system. Simulate real observation process in remote sensing detection from different distance using specified field diaphragm. Apply sensor model, analyze error in field data sets of multidirectional radiation measurements with wide field of view (FOV). (Details see in Publication)*
- **GPU-based acceleration** for **Monte Carlo ray-tracing of complex 3D scene (Computer graphics & GPU)**
  04/2012 – 06/2012
  Objective: Establish two GPU-based acceleration models for Monte Carlo ray-tracing of complex 3D scene. (Details see in Publication)
- Bachelor Capstone: **A Radiosity Transfer Model of Fluorescent Effects in Complex Canopies (Ray-tracing)**
  02/2012 – 07/2012
  Objective: Invent a Photon-Mapping Ray-tracing model, which simulates radiation propagation process within complex canopy structures. Add leaf fluorescent emission into the traditional scattering process, and simulate the fluorescent radiation distribution within canopies. By the using different spectral properties and structural properties, I analyze the distribution of fluorescent emission from several widely grew crop structures.

- **Somatosensory Control Device of the Angry Birds (Embedded system design)**
  05/2011-09/2011
  Objective: Develop a somatosensory controller attached to the computer game Angry Birds. By using a pair of tension force sensors and a tilt angle sensor, the C8051F microprocessor gather control information when player pulling the real slingshot. The electric signals are simultaneously sent back to computer to control the game by bluetooth network.
  Awards: Third Place in National Innovation & Entrepreneurship from China.

PUBLICATIONS & PRESENTATIIONS

The impact of sensor field-of-view and distance on field measurements of directional reflectance factors: A simulation study for row crops
Journal: Remote Sensing of Environment (Impact Factor: 5.103)

GPU-based acceleration for Monte Carlo ray-tracing of complex 3D scene
Geoscience and Remote Sensing Symposium (IGARSS), 2012 IEEE International / ISSN: 2153-6996

A Computer Simulation Model to Compute the Radiation Transfer of Mountainous Regions
Proceeding of SPIE Conference on Remote Sensing 2011/Proc. SPIE 8174, 817426 (2011)

A Radiosity-based Model to Compute the Radiation Transfer of Soil Surface
Proceeding of SPIE Conference on Remote Sensing 2011/Proc. SPIE 8174, 81742G (2011)