

KYOUNG ROK LEE

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PROFILE

PhD candidate in electrical and computer engineering have relevant experiences in computer vision, algorithms, 3D video, Machine Learning, and image processing.

EDUCATION

University of California, San Diego, San Diego, CA *December 2014 (expected)*

Ph.D. in *Electrical and Computer Engineering*

ECE Programs of Study: Signal and Image Processing

University of California, San Diego, San Diego, CA *December 2010*

Master of Science in *Computer Science and Engineering* (GPA: 3.59/4.0)

Concentration Areas: Computer Graphics and Vision

Kyungpook National University, Daegu, South Korea *February 2008*

Bachelor of Science in *Computer Engineering* (GPA: 4.11/4.5)

EXPERIENCE

University of California, San Diego September 2009 - Present

PhD Candidate

La Jolla, CA

- Algorithm development in C++ and CUDA to enhance noisy or low-resolution depth maps using high-resolution color images. The approach is based on sample selection and refinement in conjunction with multi-lateral filtering.
- Algorithm development in C++ and CUDA for Simultaneous Localization And Mapping (SLAM) and 3D reconstruction using a handheld RGB-D camera. The method is effective in challenging situations such as fast camera motion or geometrically featureless scenes. The approach includes a robust orientation estimation based on quaternion method and a weighted Iterative Closest Point method for better rate of convergence in optimization and accuracy in resulting trajectory.

Qualcomm Korea June 2011 - September 2011

Interim Engineering Intern

Seoul, South Korea

- Development and simulation in C++ for a text detection algorithm in natural images based on machine learning technique. Resulting algorithm is used for real-time translator application.

Atalgo, Inc. June 2009 - September 2009

Software Engineering Intern

Poway, CA

- Development of an object extraction method in C++ for video conference.
- Optimization of existing encoding method to provide high-quality video while reducing the bandwidth required.

TEACHING

Teaching Assistant for DSP labs on TI C6713 DSP Starter Kit (Digital Signal Processing I, Winter Quarter, 2012).

PUBLICATION

- K.-R. Lee**, T. Nguyen, “*Robust Tracking and Mapping with a Handheld RGB-D Camera*”, in IEEE Winter Conference on Applications of Computer Vision, Steamboat Spring, CO, Mar. 2014.
- H. Azartash, **K.-R. Lee**, T. Nguyen, “*Visual odometry for RGB-D cameras for dynamic scenes*”, in IEEE International Conference on Acoustics, Speech, and Signal Processing, Florence, Italy, May. 2014.
- K.-R. Lee**, R. Khoshabeh, T. Nguyen, “*Sampling-based Robust Multi-lateral Filtering for Depth Enhancement*”, in European Signal Processing Conference, Bucharest, Romania, Aug. 2012.
- K.-R. Lee**, “*Learning-based Trimap Generation for Video Matting*” (Master Thesis).

PATENT

- K.-R. Lee**, T. Nguyen, “*Sampling-based multi-lateral filter method for depth map enhancement and codec*”, World Patent, WO2013173749 A1, Nov 21, 2013.

RELEVANT COURSES

Computer Vision, Computer Graphics, Video Processing, Algorithms, Data Structure, Digital Signal Processing, Digital Image Processing.

EXTRACURRICULAR ACTIVITIES

- ECE Design Competition (April, 2012) : Smart Mirror Project (2nd prize).
- CWC Research Review 2011 (November, 2011): ”A Nobel Depth Map Super-resolution Method using Color Images”
- UCSD Research Expo 2010 (April, 2010): Spectral Video Tracking.
- Mobile-Display NURI Expo 2006 (November, 2006): PDA Music Service Application using RFID.
- Student software Competition (December, 2001): Arcade game presentation.

TECHNICAL STRENGTHS

Computer Languages	C, C++, CUDA, C#, Java, PHP OpenCV, OpenGL, Point Cloud Library (PCL)
Tools	Visual Studio, Matlab, Photoshop