

Soonam Lee

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EDUCATION

- Purdue University**, West Lafayette, IN Aug 2012 – Present
Ph. D. in Electrical and Computer Engineering GPA : 4.00 / 4.00
• Advisor: Prof. Edward J. Delp
- University of Michigan**, Ann Arbor, MI Jan 2011 – Apr 2012
M. S. in Mathematics GPA : 7.220 / 9.000
- University of Michigan**, Ann Arbor, MI Sep 2009 – Apr 2012
M. S. in Electrical Engineering: Systems (Major: Signal Processing, Minor: Communication) GPA : 7.220 / 9.000
• Advisor: Prof. Benjamin Kuipers
- Hanyang University**, Seoul, Korea Mar 2001 – Aug 2008
B. S. in Electrical & Computer Engineering (Summa Cum Laude) GPA : 4.15 / 4.50
B. S. in Information Technology Management
• Advisor: Prof. Dongweon Yoon

PROFESSIONAL EXPERIENCE

- Video and Image Processing (VIPER) Lab, Purdue University, West Lafayette, IN** Aug. 2012 – Present
Graduate Research Assistant
• Research on various 2D and 3D segmentation methods with multiphoton microscopy images
• Research on microscopy image registration along depth and time
• Developed microscopy image (2D) and volume (3D) visualization tool
- Flat Panel Display Team, Apple Inc., Cupertino, CA** May. 2016 – Aug. 2016
Graduate Research Intern
• Display algorithm intern
- New Business Initiative (NBI), Intel Corporation, Hillsboro, OR** May. 2015 – Aug. 2015
Graduate Research Intern
• Research on hardware-assisted object classification schemes using sparse coding in real time application (U.S. Patent published)
• Research on activity classification using keyframe selection techniques applied to deep learning method
- Vision Algorithm Research Team, Delphi, Agoura Hills, CA** May. 2014 – Aug. 2014
Graduate Research Intern
• Research on image and video segmentation using SLIC superpixels method for advanced driver assistance systems (ADAS)
• Developed vehicle ego-motion estimation methods using structure from motion
- The Intelligent Robotics Lab, University of Michigan, Ann Arbor, MI** Aug. 2010 – Apr. 2012
Graduate Research Assistant

- Developed background subtraction methods in temporal domain using 3-way factorized Restricted Boltzmann Machine (RBM)
- Research on foreground / background segmentation under arbitrarily moving camera by establishing appropriate objective function

ECE Department, Purdue University, West Lafayette, IN

Graduate Teaching Assistant

- Engineering Projects In Community Service (EPICS), Fall 2018
- Engineering Projects In Community Service (EPICS), Spring 2018
- Engineering Projects In Community Service (EPICS), Fall 2017
- Engineering Projects In Community Service (EPICS), Spring 2017
- Engineering Projects In Community Service (EPICS), Fall 2016
- ECE 255: Introduction to Electronic Analysis and Design, Spring 2016
- ECE 301: Signals and Systems, Fall 2015
- ECE 208: Electronic Devices and Design Laboratory, Spring 2015
- ECE 255: Introduction to Electronic Analysis and Design, Fall 2014

PUBLICATIONS

- S. Han, **S. Lee**, C. Fu, P. Salama, K. W. Dunn, and E. J. Delp, "Nuclei counting in microscopy images with three dimensional generative adversarial networks," Submitted to *Proceedings of the SPIE Conference on Medical Imaging*, February 2019, San Diego, CA.
- C. Fu, **S. Lee**, D. J. Ho, S. Han, P. Salama, K. W. Dunn, and E. J. Delp, "Three dimensional fluorescence microscopy image synthesis and segmentation," *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshop (CVPRW)*, June 2018, Salt Lake City, UT.
- **S. Lee**, C. Fu, P. Salama, K. W. Dunn, and E. J. Delp, "Tubule segmentation of fluorescence microscopy images based on convolutional neural networks with inhomogeneity correction," *Proceedings of the IS&T International Symposium on Electronic Imaging*, January 2018, Burlingame, CA.
- **S. Lee**, P. Salama, K. W. Dunn, and E. J. Delp, "Segmentation of fluorescence microscopy images using three dimensional active contours with inhomogeneity correction," *Proceedings of the IEEE International Symposium on Biomedical Imaging (ISBI)*, April 2017, Melbourne, Australia.
- **S. Lee**, P. Salama, K. W. Dunn, and E. J. Delp, "Boundary fitting based segmentation of fluorescence microscopy images," *Proceedings of the SPIE/IS&T International Symposium on Electronic Imaging*, February 2015, San Francisco, CA.

PATENTS

- N. K. Jain and **S. Lee**, "Technologies for classification using sparse coding in real time," *U.S. Pub. No.* US2018/0005086 A1, *World Pub. No.* WO2018/004980 A1, filed on July 1, 2016, published on January 4, 2018.

POSTERS

- N. J. Gadgil, **S. Lee**, C. Fu, D. J. Ho, K. W. Dunn, P. Salama, and E. J. Delp, "Three dimensional segmentation of fluorescence microscopy images of the kidney," *2014 IUPUI Imaging Research Symposium*, October, 2014, Indianapolis, IN.
- **S. Lee**, K. S. Lorenz, P. Salama, K. W. Dunn, and E. J. Delp, "Three dimensional segmentation of fluorescence microscopy images using active surfaces," *Gastroenterology Symposium*, November 2013, West Lafayette, IN.

RELEVANT COURSEWORK

- Purdue University: Optimization Methods for Systems and Control; Digital Image Processing I; Digital Image Processing II; Principles of Digital Color Imaging Systems; Computer Vision; Statistical Pattern Recognition and Decision Making Processes; Introduction to Statistical Mathematics; Introduction to Optical Microscopy
- University of Michigan (EECS): Machine Learning; Computer Vision; Unsupervised Feature Learning; Mathematical Methods for Signal Processing; Introduction to Digital Communication and Coding; Digital Communication Theory; Estimation, Filtering, and Detection; Probability and Random Process
- University of Michigan (MATH): Linear Algebra; Introduction to Probability; Advanced Calculus I; Advanced Calculus II; Continuous Optimization; Numerical Method for Scientific Computing I; Real Analysis; Sparse Approximation and Compress Sensing
- Hanyang University: Signal and Systems; Digital Signal Processing; Image Processing; Statistical Communication Engineering; Communication System; Digital Communication; Wireless Communication; Control Engineering; Modern Control System

TECHNICAL SKILLS

- High Level Languages: MATLAB; C; Python; Lua; JavaScript
- Image Processing Library: OpenCV
- Deep Learning Library: Torch; PyTorch

HONORS & SERVICES

- Conference Travel Grant from College of Engineering at the Purdue University (2017)
- Overseas Scholarship Grantee from Hanyang University (2009 - 2010)
- Graduated Summa Cum Laude (3rd/102)
- Reviewer of the *PLoS ONE*
- IEEE Graduate Student Member
- IEEE Signal Processing Society Member
- IS&T Graduate Student Member
- Member of the Society for Industrial and Applied Mathematics (SIAM)
- Member of the Korean-American Scientists and Engineers Association (KSEA)
- Member of the Mensa Korea

REFERENCES

- Available upon request