

DAVID JOON HO

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RESEARCH INTEREST

Computer Vision, Deep Learning, Semantic Segmentation, Object Detection, Digital Image Processing

EDUCATION

Purdue University *December 2018 (Expected)*

Doctor of Philosophy in Electrical and Computer Engineering

GPA: 3.59/4.00

University of Illinois at Urbana-Champaign *May 2012*

Master of Science in Electrical and Computer Engineering

GPA: 3.50/4.00

University of Illinois at Urbana-Champaign *May 2010*

Bachelor of Science in Electrical and Computer Engineering with Honors

Minor in Mathematics

Minor in Computer Science

GPA: 3.69/4.00

EXPERIENCE

Purdue University June 2014 - Present

VIPER Laboratory (advisor: Professor Edward J. Delp) *West Lafayette, IN*

- Analyzing fluorescence microscopy images to automatically detect and segment biological structures
- Developing three dimensional convolutional neural networks to detect and segment nuclei
- Training networks using a small set of ground truth images or a set of synthetic microscopy volumes
- Identifying tubule boundary in three dimensions using steerable filters from rat kidney data set

HP May 2017 - August 2017

Summer Internship *Palo Alto, CA*

- Designed person segmentation methods in images or webcam video using convolutional neural networks
- Developed data augmentation techniques using various public datasets and an HP private dataset
- Fine-tuned a convolutional neural network using augmented training images for accurate segmentation
- Trained a compact convolutional neural network using augmented images for faster segmentation
- Interview with HP Labs: <http://newsblog.ext.hp.com/t5/HP-newsroom-blog/Summer-2017-interns-at-HP-Labs-David-Ho/ba-p/1015>

Purdue University August 2014 - Present

Graduate Teaching Assistant (ECE 202: Linear Circuit Analysis II) *West Lafayette, IN*

- Answering questions from students to help them understand materials during weekly office hours
- Creating homework, quiz, and exam solutions
- Advising students to implement group projects using Python or MATLAB
- Administrating the course including managing course website, grading exams, and giving lectures

Purdue University June 2018 - August 2018

Graduate Lecturer (ECE 202: Linear Circuit Analysis II) *West Lafayette, IN*

- Teaching a summer course as a lecturer

The United States Patent and Trademark Office

July 2012 - August 2013

Patent Examiner (Electrical Audio Signal Processing Systems and Devices)

Alexandria, VA

- Involved in technical and legal analysis of inventions claimed in U.S. patent applications
- Wrote office actions for rejection/allowance decisions supported by publicly known prior arts
- Conducted telephonic interviews with applicants representatives for intermediate communications
- Completed training courses on 35 U.S.C. 101, 102, 103, 112, double patenting, and claim interpretation

University of Illinois at Urbana-Champaign

January 2011 - May 2012

Magnetic Resonance Functional Imaging Lab (advisor: Professor Brad Sutton)

Urbana, IL

- Analyzed artifacts of susceptibility gradient effects by interpreting shifted and skewed k-space trajectory
- Formulated BOLD sensitivity and calibration function to correct the expected variation in the signal
- Identified regions of interest in a brain that have significant difference between old and young subjects

University of Illinois at Urbana-Champaign

May 2009 - May 2010

Signal and Image Processing (advisor: Professor Minh Do)

Urbana, IL

- Programmed fast super-resolution algorithm through Polyphase Decomposition and Armijo Line Search
- Designed an algorithm to reduce the running time by 2.19 times compared to the original algorithm
- Presented the senior thesis at the Undergraduate Research Symposium to students and faculty

PUBLICATIONS

[C6] 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**,” To appear, *Proceedings of the Computer Vision for Microscopy Image Analysis workshop at Computer Vision and Pattern Recognition*, June 2018, Salt Lake City, UT.

[C5] **D.J. Ho**, C. Fu, P. Salama, K.W. Dunn, and E.J. Delp, “**Nuclei detection and segmentation of fluorescence microscopy images using three dimensional convolutional neural networks**,” To appear, *Proceedings of the IEEE International Symposium on Biomedical Imaging*, April 2018, Washington D.C.

[C4] **D.J. Ho** and Q. Lin, “**Person segmentation using convolutional neural networks with dilated convolutions**,” To appear, *Proceedings of the IS&T International Symposium on Electronic Imaging*, February 2018, Burlingame, CA.

[C3] **D.J. Ho**, C. Fu, P. Salama, K.W. Dunn, and E.J. Delp, “**Nuclei segmentation of fluorescence microscopy images using three dimensional convolutional neural networks**,” *Proceedings of the Computer Vision for Microscopy Image Analysis workshop at Computer Vision and Pattern Recognition*, pp. 834-842, July 2017, Honolulu, HI. DOI: 10.1109/CVPRW.2017.116

[C2] C. Fu, **D.J. Ho**, S. Han, P. Salama, K.W. Dunn, and E.J. Delp, “**Nuclei segmentation of fluorescence microscopy images using convolutional neural networks**,” *Proceedings of the IEEE International Symposium on Biomedical Imaging*, pp. 704-708, April 2017, Melbourne, Australia. DOI: 10.1109/ISBI.2017.7950617

[C1] **D.J. Ho**, P. Salama, K.W. Dunn, and E.J. Delp, “**Boundary segmentation for fluorescence microscopy using steerable filters**,” *Proceedings of the SPIE Conference on Medical Imaging*, pp. 101330E-1-11, February 2017, Orlando, FL. DOI: 10.1117/12.2254627

HONORS

Received the Estus H. and Vashti L. Magoon Award for excellence in teaching

Received the Conference Travel Grant provided by the College of Engineering at Purdue University

Presented at the Purdue IEEE ECE Research Fair 2016 on the overview of image and video processing

Received the Summer Research Grant nominated by Purdue University

Joined Eta Kappa Nu (Electrical and Computer Engineering Honor Society)

Completed Edmund J. James Scholar Honors program at University of Illinois at Urbana-Champaign

Received the O. Thomas & Martha S. Purl Scholarship as top 10% among seniors

Received the Jules D. Falzer Memorial Scholarship as top 10% among juniors

SKILLS

Programming Languages	Python, MATLAB, C, C++
Deep Learning Frameworks	PyTorch, Torch, Caffe
Language	Fluent in Korean