

# Hongki Lim

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hklim@inha.ac.kr  
<https://limhongki.github.io>

## Education

**University of Michigan, Ann Arbor** Sep 2015 - May 2020  
*Ph.D., Electrical Engineering and Computer Science*  
with a concentration in signal processing and machine learning

**Inha University** Feb 2006 - Aug 2012  
*B.S., Electronic Engineering*

## Research Interest

Generative model; Unsupervised learning; Image reconstruction and analysis

## Research and Work Experience

**Inha University** *Assistant Professor* Mar 2022 - Present  
*Department of Electronic Engineering*

**Siemens Healthineers** *Senior AI scientist* Sep 2020 - Jan 2022  
*Digital Technology & Innovation*

**University of Michigan** *Research assistant* Aug 2016 - May 2020  
*Advised by Prof. Jeffrey Fessler and Prof. Yuni Dewaraja*

**Qualcomm** *Internship* Feb - Jun 2015  
*Computer Vision Group, Corporate Research & Development*

**Samsung Electronics** *Associate* Jul 2012 - Jan 2015  
*Technology Planning Group, Strategic Planning Team, System LSI Division*

**Korean Air Force** *Sergeant* Jul 2009 - Aug 2011  
*Avionics Maintenance Battalion*

## Dissertation

Quantitative image reconstruction methods for low signal-to-noise ratio emission tomography  
Advisor: Jeffrey A. Fessler, Yuni K. Dewaraja

## Journal Papers

[5] Il Yong Chun, Zhengyu Huang, **Hongki Lim**, and Jeffrey Fessler. Momentum-Net: Fast and convergent iterative neural network for inverse problems. *IEEE Trans. Pattern Anal. Mach. Intell. (TPAMI)*, 45(4):4915-4931, April 2023

[4] Haowei Xiang, **Hongki Lim**, Jeffrey Fessler, and Yuni Dewaraja. A deep neural network for fast and accurate scatter estimation in quantitative SPECT/CT under challenging scatter conditions. *Eur. J. Nuc. Med. Mol. Im. (EJNMMI)*, 47:2956-67, Dec. 2020.

[3] **Hongki Lim**, Il Yong Chun, Yuni Dewaraja, and Jeffrey Fessler. Improved low-count quantitative PET reconstruction with an iterative neural network. *IEEE Trans. Med. Imag. (TMI)*,

39(11):3512-22, Nov. 2020.

[2] **Hongki Lim**, Jeffrey Fessler, Scott Wilderman, Allen Brooks, and Yuni Dewaraja. Y-90 SPECT maximum likelihood image reconstruction with a new model for tissue-dependent bremsstrahlung production: A proof-of-concept study. *Phys. Med. Biol. (PMB)*, 63(11):115001, May. 2018.

[1] **Hongki Lim**, Yuni Dewaraja, and Jeffrey Fessler. A PET reconstruction formulation that enforces non-negativity in projection space for bias reduction in Y-90 imaging. *Phys. Med. Biol. (PMB)*, 63(3):035042, Feb. 2018.

## Conference Proceedings and Abstracts

[12] **Hongki Lim**, Yuni Dewaraja, and Jeffrey Fessler. Joint low-count PET/CT segmentation and reconstruction with paired variational neural networks. *Proc. SPIE 11312 Medical Imaging: Phys. Med. Im.*, p. 113120U, 2020. **Oral presentation**

[11] Haowei Xiang, **Hongki Lim**, Jeffrey Fessler, and Yuni Dewaraja. SPECT/CT scatter correction using deep learning: implementation in Y-90 imaging. *Proc. IEEE Nuc. Sci. Symp. Med. Im. Conf.*, pp. 1-3, 2019.

[10] **Hongki Lim**, Il Yong Chun, Jeffrey Fessler, and Yuni Dewaraja. Improved low count quantitative SPECT reconstruction with a trained deep learning based regularizer. *J. Nuc. Med. (Abs. Book)*, 60(s1): 42., 2019. **Oral presentation**

[9] **Hongki Lim**, Zhengyu Huang, Jeffrey Fessler, Yuni Dewaraja, and Il Yong Chun. Application of trained Deep BCD-Net to iterative low-count PET image reconstruction. *Proc. IEEE Nuc. Sci. Symp. Med. Im. Conf.*, pp. 1-4, 2018. **Oral presentation**

[8] Se Young Chun, **Hongki Lim**, Jeffrey Fessler, and Yuni Dewaraja. On Parameter Selection for Joint Spectral Reconstruction in Y90 SPECT. *Proc. IEEE Nuc. Sci. Symp. Med. Im. Conf.*, pp. 1-4, 2018.

[7] Il Yong Chun, **Hongki Lim**, Zhengyu Huang, and Jeffrey Fessler. Fast and convergent iterative signal recovery using trained convolutional neural networks. *Proc. Allerton*, pp. 155-159, Oct. 2018.

[6] **Hongki Lim**, Jeffrey Fessler, and Yuni Dewaraja. Joint dual photopeak image reconstruction in Lu-177 SPECT. *Eur. J. Nuc. Med. Mol. Imaging*, (Vol. 45, pp. S95-S96), Oct. 2018. **Oral presentation**

[5] **Hongki Lim**, Kyungsang Kim, Quanzheng Li, Jeffrey Fessler, and Yuni Dewaraja. Bias reduction in Y-90 PET with reconstruction that relaxes the non-negativity constraint. *J. Nuc. Med. (Abs. Book)*, 59(s1): 580. 2018. **Oral presentation**

[4] **Hongki Lim**, Yuni Dewaraja, and Jeffrey Fessler. Reducing bias in Y-90 PET images by enforcing non-negativity in projection space. *Proc. IEEE Nuc. Sci. Symp. Med. Im. Conf.*, pp. 1-4, 2017. **Oral presentation**

[3] **Hongki Lim**, Neal Clinthorne, Maurizio Conti, Jeffrey Fessler, and Yuni Dewaraja. Quantitative Y-90 PET for dosimetry in radioembolization. *Eur. J. Nuc. Med. Mol. Imaging*, 44(s2):S398, Oct. 2017.

[2] **Hongki Lim** and Yuni Dewaraja. Impact of Tc-99m SPECT reconstruction methods on lung shunt and lesion/normal liver activity quantification in radioembolization. *J. Nuc. Med. (Abs. Book)*, 58(s1):1032, May 2017. **Poster presentation**

[1] **Hongki Lim**, Yuni Dewaraja, and Jeffrey Fessler. Y-90 SPECT maximum likelihood image reconstruction with a new model for tissue-dependent bremsstrahlung production. *J. Nuc. Med. (Abs. Book)*, 58(s1):746, May 2017. **Oral presentation**

## Courseworks

### **Inha University**

Electromagnetics, Linear algebra

Spring 2022

Machine learning, Deep learning

Fall 2022

Electromagnetics, Linear algebra

Spring 2023

## Seminars

Michigan State University Comp. Math. Sci. and Engin.

Feb 2020

Machine learning based image reconstruction and analysis methods for low signal-to-noise ratio emission tomography.

Massachusetts General Hospital Gordon Center for Medical Imaging

Dec 2019

Quantitative image reconstruction and analysis methods for low signal-to-noise ratio emission tomography

## Scientific Service

**Journal Reviews** IEEE Transactions on Medical Imaging (IEEE-TMI), IEEE Transactions on Computational Imaging (IEEE-TCI), IEEE Transactions on Radiation and Plasma Medical Sciences (IEEE-TRPMS), Journal of Mathematical Imaging and Vision (JMIV), Quantitative Imaging in Medicine and Surgery (QIMS)

**Review Editor** Frontiers in Nuclear Medicine