

Hongki Lim

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<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 modeling; Unsupervised learning; Inverse Problem

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

Samsung Electronics *Internship* Dec 2011 - Feb 2012
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