

# 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

Computer vision; Generative modeling; Unsupervised learning; Inverse Problem; Medical imaging

## 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. early access in *IEEE Trans. Pattern Anal. Mach. Intell. (TPAMI)*.

[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

## 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)

## Awards & Scholarships

IEEE NSS/MIC Trainee Grant

2017, 2018

Rackham Conference Travel Grant

2016, 2017, 2018

Awarded Second Place, UMich EECS 556: Image Processing, Article

Apr 2016

Awarded Scholarship for High Score on TOEIC

Fall 2011

Awarded First Place Prize at Control System Design Contest

Fall 2008

Awarded Scholarship from School of Logistics

Spring 2007

Awarded Semester High Honors

Spring, Fall 2006