

# Changwoo Lee

Curriculum Vitae

## CONTACT INFORMATION

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## EDUCATION

**University of Michigan**, Ann Arbor, Michigan, USA

- Ph.D. in Electrical and Computer Engineering
- Adviser: Prof. Hun-Seok Kim

Aug 2020 – Present

**Hanyang University**, Seoul, Republic of Korea

- M.S. in Electronics and Computer Engineering
- B.S. in Electronic Engineering

Mar 2018 – Feb 2020

Mar 2012 – Feb 2018

## RESEARCH INTERESTS

Hardware-Efficient Deep Generative Models and Deep Neural Networks,

- Function and Matrix Approximation Under Computational Constraints for Accelerating Diffusion Model, Transformer, and CNN Inference.

Machine Learning and Deep Learning for Multi-modal Computer Vision and Wireless Communications

- Autonomous Driving, Point Clouds, Joint Source-Channel Coding

## PREPRINTS

**Lee, C.** and Kim, H. *Differentiable Learning of Generalized Structured Matrices for Efficient Deep Neural Networks*, arXiv preprint arXiv:2310.18882, 2023. Under Review.

Liu, B., **Lee, C.**, Cao, A., and Kim, H. *Unified Signal Compression Using a GAN with Iterative Latent Representation Optimization*, arXiv preprint arXiv:2109.11168, 2021.

## PUBLICATIONS

Fan, Z., Zhang, Q., Abillama, P., Shoouri, S., **Lee, C.**, Blaauw, D., Kim, H., and Sylvester, D. *TaskFusion: An Efficient Transfer Learning Architecture with Dual Delta Sparsity for Multi-Task Natural Language Processing*, In Proceedings of the 50th Annual International Symposium on Computer Architecture (ISCA), 2023.

Bian, C., Hsu, C., **Lee, C.**, Kim, H. *Learning-Based Near-Orthogonal Superposition Code for MIMO Short Message Transmission*, IEEE Transactions on Communications, 2023

**Lee, C.**, Hu, X., and Kim, H. *Deep Joint Source Channel Coding with Iterative Source Error Correction*, The 26th International Conference on Artificial Intelligence and Statistics (AISTATS), 2023

Fan, Z., An, H., Zhang, Q., Xu, B., Xu, L., Tseng, C., Peng, Y., Cao, A., Liu, B., **Lee, C.**, Wang, Z., Liu, F., Wang, G., Jiang, S., Kim, H., Blaauw, D., Sylvester, D. *Audio and Image Cross-Modal Intelligence via a 10TOPS/W 22nm SoC with Back-Propagation and Dynamic Power Gating*, IEEE Symposium on VLSI Circuits (VLSI-Symposium), 2022

Kim, D., **Lee, C.**, and Chung, K. *A Confidence-Calibrated MOBA Game Winner Predictor*, IEEE Conference on Games (CoG), 2020.

**Lee, C.**, and Chung, K. *GRAM: Gradient Rescaling Attention Model for Data Uncertainty Estimation in Single Image Super Resolution*, IEEE International Conference on Machine Learning and Applications (ICMLA), 2019.

## SKILLS

### PROGRAMMING LANGUAGES

Python, Julia, Matlab

### FRAMEWORKS

Pytorch, Tensorflow, Hydra, Pytorch-Lightning, Huggingface

### RELEVANT COURSES

- Umich EECS 501 Probability and Random Processes
- Umich EECS 551 Matrix Methods for Signal Processing, Data Analysis and Machine Learning
- Umich EECS 559 Optimization Methods in Signal Processing and Machine Learning
- Umich EECS 600 Function Space Methods in System Theory

- Umich EECS 598 Special Topics: Randomized Numerical Linear Algebra for Machine Learning
- Umich EECS 598 Special Topics: Statistical Learning Theory

**ACADEMIC  
EXPERIENCE**

**University of Michigan**, Ann Arbor, Michigan, USA  
*Graduate Student Research Assistant*

Aug 2020 – Present

**TEACHING  
EXPERIENCE**

**TEACHING ASSISTANT**

- Embedded System, Hanyang University Spring 2019
- VLSI Design, Hanyang University Fall 2018
- SoC Design, Hanyang University Spring 2018

**AWARDS &  
SCHOLARSHIPS**

- Hanyang University TA Scholarship Spring 2019
- Hanyang Graduate School Scholarship (4 semesters) 2018-2019
- Hanyang Brain Scholarship (2 semesters) 2017
- Undergraduate Scholarship, Korean Government, Korea Student Aid Foundation Fall 2016
- Undergraduate Scholarship, Hanyang University (2 semesters) 2012-2013

[CV compiled on 2023-11-26]