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 — Aug 2020 – Present
  - Adviser: Prof. Hun-Seok Kim

Hanyang University, Seoul, Republic of Korea

- M.S. in Electronics and Computer Engineering — Mar 2018 – Feb 2020
- B.S. in Electronic Engineering — Mar 2012 – Feb 2018

RESEARCH INTERESTS

Energy Efficiency and Robustness in Machine Learning and Deep Learning

- Diffusion Models for Fewer Function Evaluations
- Learnable Structured Sparsity for Efficient Deep Learning Systems
- Efficient and Robust Multi-modal Systems

PREPRINTS

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

Changwoo Lee and Hun-Seok Kim. *Differentiable Learning of Generalized Structured Matrices for Efficient Deep Neural Networks,* International Conference on Learning Representations (ICLR), 2024.

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.

Chenghong Bian, Chin-Wei Hsu, **Changwoo Lee**, and Hun-Seok Kim. *Learning-Based Near-Orthogonal Superposition Code for MIMO Short Message Transmission*, IEEE Transactions on Communications (TCOM), 2023

Changwoo Lee, Xiao Hu, and Hun-Seok Kim *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

Dong-Hee Kim, **Changwoo Lee**, and Ki-Seok Chung. *A Confidence-Calibrated MOBA Game Winner Predictor,* IEEE Conference on Games (CoG), 2020.

Changwoo Lee, and Ki-Seok Chung. *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

Math. Matrix Decomposition, (Randomized) Linear Algebra, Kernel Methods, (Nonparametric) Density Estimation, Optimization Theory, Information Theory
Deep Learning. End-to-end DNN Compression, Weight/Activation Quantization, Large Language Models (LLMs), Diffusion Models
Programming Languages. Python, PyTorch, Julia, Matlab
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 2024-01-17*]