Soo Min Kwon

kwonsm@umich.edu | https://soominkwon.github.io/ | https://github.com/soominkwon

Education

University of Michigan — *Ann Arbor, MI*
PH.D. ELECTRICAL AND COMPUTER ENGINEERING — *Sept. 2022 – Present*
- Advisor: Prof. Laura Balzano and Prof. Qing Qu

Rutgers University — *New Brunswick, NJ*
M.S. ELECTRICAL AND COMPUTER ENGINEERING — *Sept. 2020 - May 2022*
- Advisor: Prof. Anand D. Sarwate

Rutgers University — *New Brunswick, NJ*
B.S. ELECTRICAL AND COMPUTER ENGINEERING — *Sept. 2016 - May 2020*
- Advisor: Prof. Anand D. Sarwate

Professional Experience

2024 **Applied Scientist Intern (Causal Inference)**, Amazon
2023 **Graduate Teaching Assistant**, University of Michigan
2022– **Graduate Research Assistant**, University of Michigan
2022 **Applied Research Intern (Forecasting)**, LinkedIn Corporation
2020-2022 **Graduate Teaching Assistant**, Rutgers University

Preprints

A. Ghosh†, **S. M. Kwon**†, R. Wang, S. Ravishankar, Q. Qu. "Learning Dynamics of Deep Matrix Factorization Beyond the Edge of Stability". Submitted to the *International Conference on Learning Representations (ICLR)*, 2025.

S. M. Kwon†, C. Blocker†, H. Raja, J. Fessler, L. Balzano. "Dynamic Subspace Estimation from Undersampled Data using Grassmannian Geodesics". Submitted to *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2025.

X. Li, **S. M. Kwon**, I. Alkhouri, S. Ravishankar, Q. Qu. "Decoupled Data Consistency for Solving General Inverse Problems with Diffusion Models." Submitted to the *International Journal of Computer Vision (IJCV)*, 2024.

Publications

C. Lee, **S. M. Kwon**, Q. Qu, H. Lee. "BLAST: Block-Level Adaptive Structured Matrices for Efficient Deep Neural Network Inference." In *Neural Information Processing Systems (NeurIPS)*, 2024.

S. M. Kwon, L. Ding, L. Balzano, Q. Qu. "On the Relationship Between Small Initialization and Flatness in Deep Networks." In *International Conference on Learning Representations (ICLR) BGPT Workshop*, 2024.

S. M. Kwon, Z. Zhang, D. Song, L. Balzano, Q. Qu. "Efficient Compression of Overparameterized Deep Models." In *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2024.

B. Song†, **S. M. Kwon**†, Z. Zhang, X. Hu, Q. Qu, L. Shen. "Solving Inverse Problems with Latent Diffusion Models via Hard Data Consistency." In *International Conference on Learning Representations (ICLR)*, 2024 **(Spotlight, Top 5%)**.

D. K. Saha, V. Calhoun, **S. M. Kwon**, A. D. Sarwate, R. Saha, S. Plis. "Federated, Fast, and Private Visualization of Decentralized Data". In *International Conference on Machine Learning (ICML) Workshop on Federated Learning*, 2023.

S. M. Kwon, X. Li, A. D. Sarwate. "Low-Rank Phase Retrieval with Structured Tensor Models." In *International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2022.

D. K. Saha, V. D. Calhoun, Y. Du, Z. Fu, R. Panta, **S. M. Kwon**, A. D. Sarwate, S. M. Plis. "Privacy-Preserving Quality Control of Neuroimaging Datasets in Federated Environments". In *Organization for Human Brain Mapping (OHBM)*, 2021.

S. M. Kwon, A. D. Sarwate. "Learning Predictors from Multidimensional Data with Tensor Factorizations". In *Rutgers University Aresty Undergraduate Research Journal*, 2021.

S. M. Kwon, S. Yang, J. Liu, X. Yang, W. Saleh, S. Patel, C. Mathews, Y. Chen. "Demo: Hands-Free Human Activity Recognition Using Millimeter-Wave Sensors". In *IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*, 2019.

Awards, Fellowships & Grants

2024 **Harvey G. and Joyce H. Behner Graduate Fellowship**, University of Michigan

2022 **PhD Rackham Merit Fellowship**, University of Michigan
ECE Outstanding Master's Student Award, Rutgers University
ECE Outstanding Teaching Assistant Award, Rutgers University
ECE Departmental Leadership & Service Award, Rutgers University

2020 **WINLAB Grant**, Rutgers University

Teaching Experience

WN 2024 **Optimization Methods for Signal Processing and Machine Learning**, University of Michigan
SP 2022 **Introduction to MATLAB**, Rutgers University
SP 2021 **Digital Signals Processing**, Rutgers University
SP 2020 **Linear Systems and Signals**, Rutgers University

Technical Skills

Programming Languages: Python, MATLAB, Scala, SQL, C++
Libraries: PyTorch, TensorFlow, Jax, Scikit-learn, NumPy, SciPy, Pandas
Software: AWS, Git, Visual Studio, Tableau, Jupyter Notebook, Microsoft Office, LaTeX

Reviewer Service

Neural Information Processing Systems (NeurIPS) Workshop on Diffusion Models, 2023
Conference on Parsimony and Learning (CPAL), 2024
Neural Information Processing Systems (NeurIPS), 2024