

Prof. Taesup Moon

- **Education**
 - Ph.D. in Electrical Engineering, Stanford University, 2008
 - M.S. in Electrical Engineering, Stanford University, 2004
 - B.S. in Electrical Engineering, Seoul National University, 2002
- **Experience**
 - 2021-current, Associate Professor, Seoul National University
 - 2017-2021, Assistant/Associate Professor, Sungkyunkwan University
 - 2015-2017, Assistant Professor, DGIST
 - 2013-2015, Research Staff Member, Samsung Advanced Institute of Technology (SAIT)
 - 2012-2013, Postdoctoral Scholar, UC Berkeley Statistics
 - 2008-2012, Scientist, Yahoo! Labs
- **Research Interests**
 - Machine Learning, Big Data, Data Science

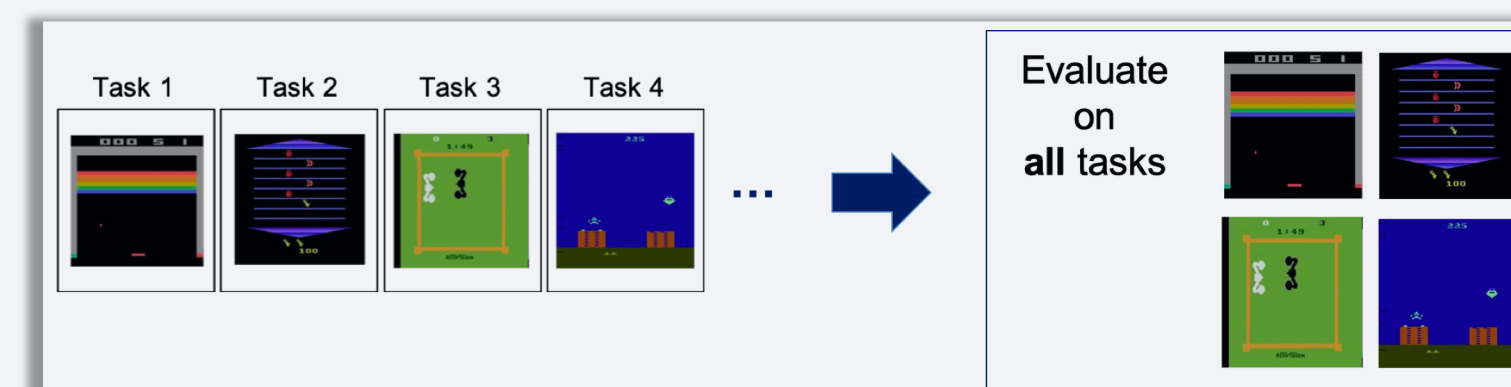
Recent Publications (Selected)

- **Top CS conferences**
 - D. Lee, S. Jung, T. Park, and T. Moon, "Fair Feature Distillation for Visual Recognition", **CVPR** 2021
 - J. Byun, S. Cha, and T. Moon, "FBI: Fast Blind Image Denoiser for Source-Dependent Noise", **CVPR** 2021
 - S. Cha, H. Hsu, T. Hwang, F. P. Calmon, and T. Moon, "CPR: Classifier-Projection Regularization for continual learning", **ICLR** 2021
 - S. Cha, T. Park, B. Kim, J. Baek, and T. Moon, "GAN2GAN: Generative Noise Learning for Blind Image Denoising with Single Noisy Images", **ICLR** 2021
 - S. Jung, H. Ahn, S. Cha, and T. Moon, "Continual Learning with Node-Importance based Adaptive Group Sparse Regularization", **NeurIPS** 2020
 - H. Ahn and T. Moon, "Iterative Channel Estimation for Discrete Denoising under Channel Uncertainty", **UAI** 2020
 - T. Park and T. Moon, "Unsupervised Neural Universal Denoiser for Finite-Input General-Output Noisy Channel", **AISTATS** 2020
 - H. Ahn, S. Cha, D. Lee and T. Moon, "Uncertainty-based Continual Learning with Adaptive Regularization", **NeurIPS** 2019
 - J. Heo, S. Joo, and T. Moon, "Fooling Neural Network Interpretations via Adversarial Model Manipulation", **NeurIPS** 2019
 - S. Cha and T. Moon, "Fully Convolutional Pixel Adaptive Image Denoiser", **ICCV** 2019
 - S. Joo, S. Cha, and T. Moon, "DoPAMINE: Double-sided Masked CNN for Pixelwise Adaptive Multiplicative Noise Despeckling", **AAAI** 2019
- **Journals**
 - D. Lee, H. Park, T. Moon, and Y. Kim, "Continual learning of Micro-Doppler signatures based human activity classification", **IEEE GRSL**, January 2021
 - J. Byun and T. Moon, "Learning blind pixelwise affine image denoiser with single noisy images", **IEEE SPL**, June 2020
 - L. Kohoutova, J. Heo, S. Cha, T. Moon, Tor D. Wager, and Choong-Wan Woo, "Interpreting machine learning models in neuroimaging: Towards a unified framework", **Nature Protocols** 2020
 - Y. Park, B. Kwon, J. Heo, X. Hu, Y. Liu, and T. Moon, "Estimating PM2.5 Concentration of the Conterminous United States via Interpretable Convolutional Neural Networks", **Environmental Pollution**, January 2020
 - B. Lee, T. Moon, S. Yoon, and T. Weissman, "DUDE-Seq: Fast, flexible, and robust denoising for targeted amplicon sequencing", **PLoS ONE**, July 2017
 - Y. Kim and T. Moon, "Human detection and activity classification based on micro-Dopplers using deep convolutional neural networks", **IEEE GRSL**, January 2016

Research Interests

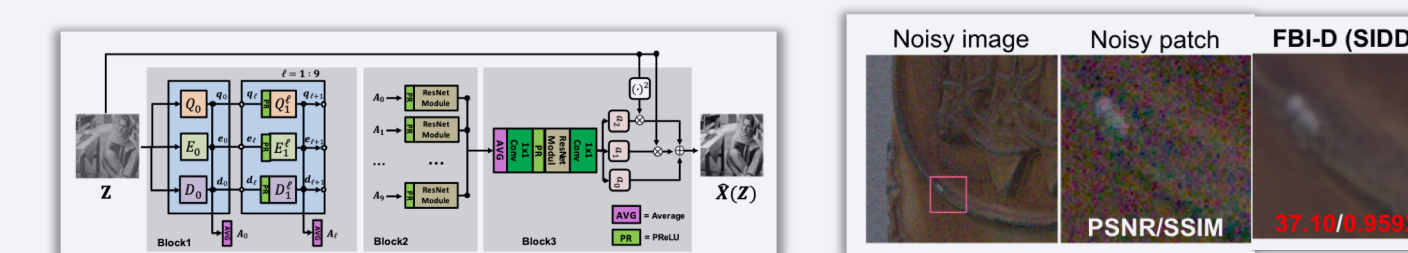
◆ Core Algorithms

- Continual Learning / Incremental Learning
 - Regularization-based methods based on Bayesian / optimization principles



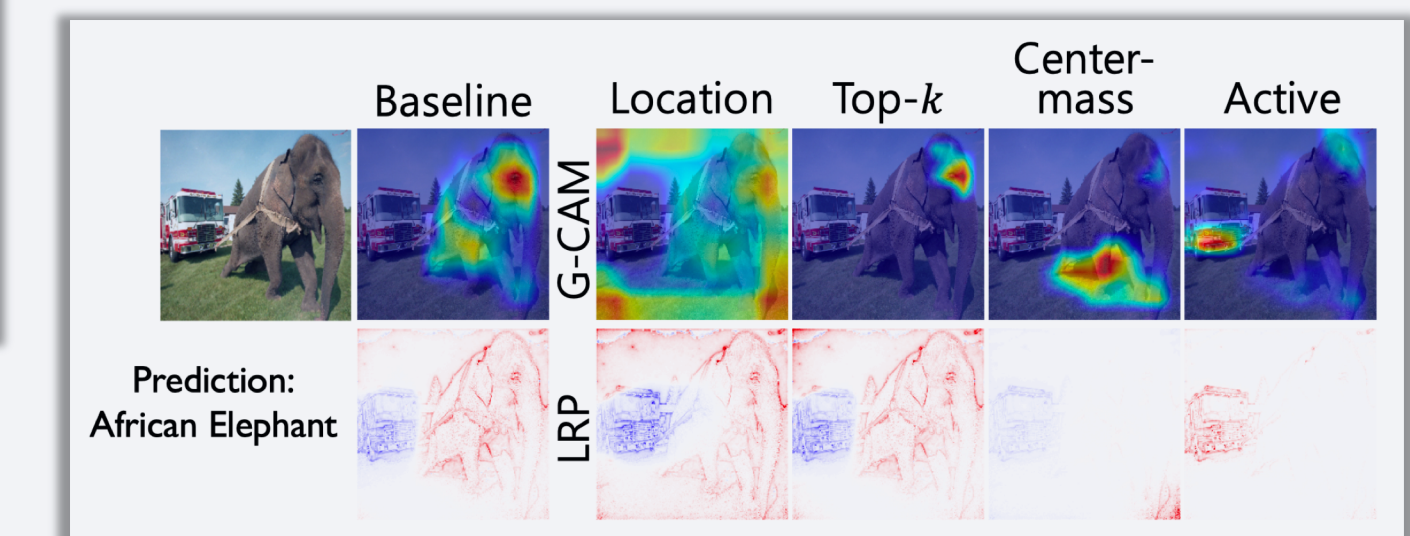
$$\mathcal{L}_t(\theta) = \mathcal{L}_{TS,t}(\theta) + \mu \sum_{n_\ell \in \mathcal{G}_0^{t-1}} \|\theta_{n_\ell}\|_2 + \lambda \sum_{n_\ell \in \mathcal{G} \setminus \mathcal{G}_0^{t-1}} \Omega_{n_\ell}^{t-1} \|\theta_{n_\ell} - \hat{\theta}_{n_\ell}^{(t-1)}\|_2$$

- Denoising
 - Unsupervised/semi-supervised Learning based practical denoising algorithms

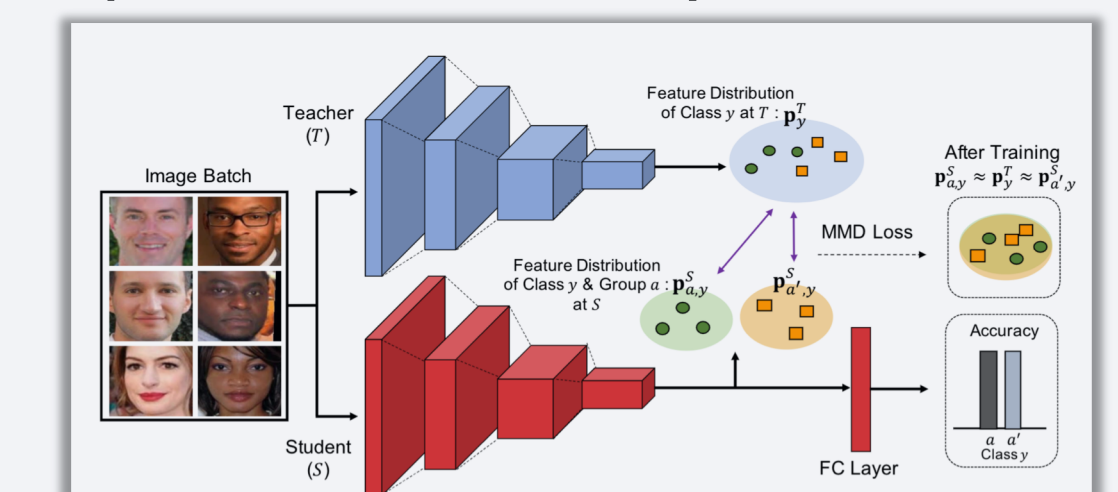


$$L_n(Z, f; \sigma^2) \triangleq \frac{1}{n} \|Z - f\|_2^2 + \frac{\sigma^2}{n} \sum_{i=1}^n (2a_{1,i} - 1)$$

- Explainable AI / Adversarial Robustness
 - Develop new XAI or model that are robust to adversarial attack / model manipulations

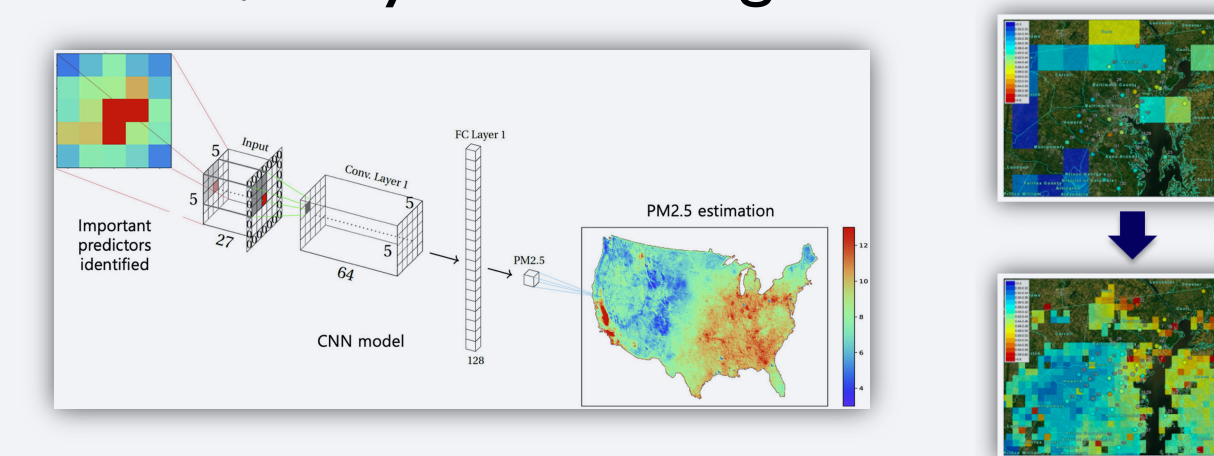


- Algorithmic Fairness
 - Utilize Knowledge Distillation (KD) to improve both accuracy and fairness

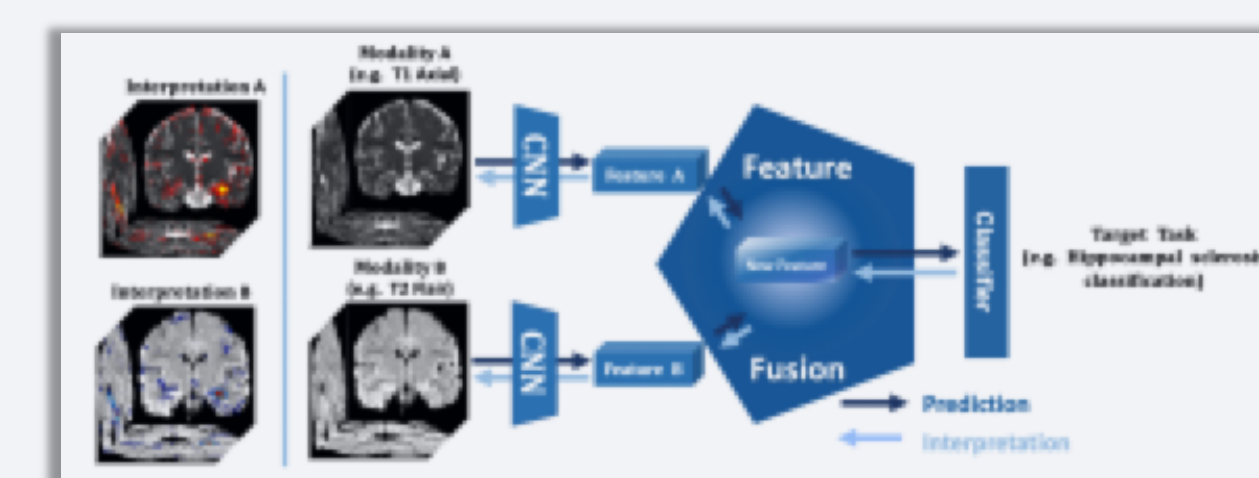


◆ Data Science Applications

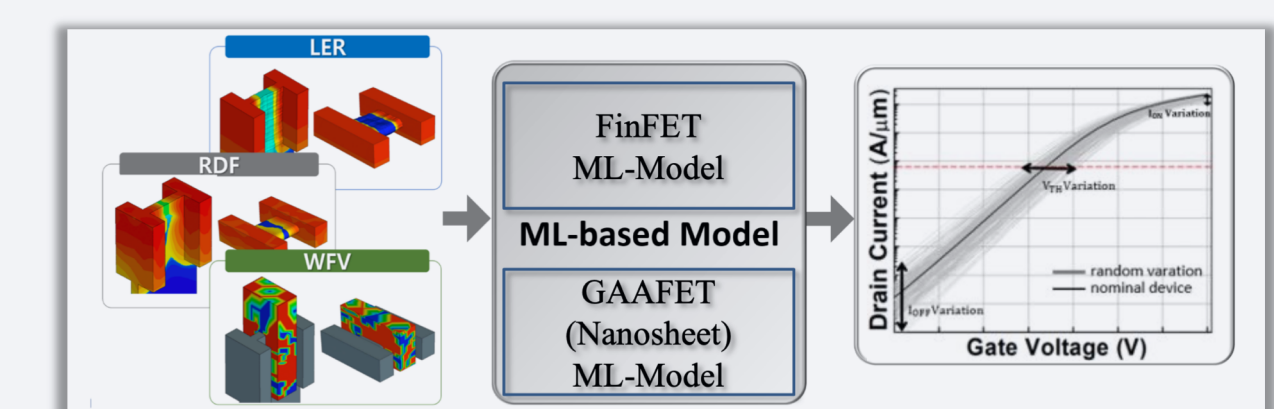
- Air Quality Monitoring



- Neuroscience



- Semiconductor Random Variation Prediction



- Multi-modal Transformer & Applications

