

Hyunmo Kang

Seoul, South Korea (Currently in New York, New York)
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Education

École Polytechnique Fédérale de Lausanne (EPFL)

Exchange Student (2023.9 – 2024.6)

Seoul National University

Physics undergraduate (Transferred from Medical School, 2019.3 – Present)

Republic of Korea Army

Sergeant (2022.2 – 2023.8)

Research Experience

Flatiron Institute, Center of Computational Neuroscience

Intern (2024.6 – 2025.2): Predicting behavior of Central Kernel Alignment with respect to the number of neurons using eigenvector overlap formula of Random Matrix Theory.

Supervised by Professor Sueyeon Chung.

Physics of Complex Systems Laboratory (EPFL)

Project student (2023.9 – 2024.6): Investigating how rare events shape learning curves using a hierarchical toy dataset.

Supervised by Professor Matthieu Wyart.

Publications

Spectral analysis of representational similarity with limited neurons (COSYNE 2024): We use random matrix theory to analyze Centered Kernel Alignment (CKA) as a measure of neural representational similarity in sparse neuron populations. Results demonstrate a systematic method to denoise CKA, even in very small number of neurons.

How rare events shape the learning curves of hierarchical data (NeurIPS 2024 Workshop on Scientific Methods for Understanding Deep Learning): We study deep networks learning hierarchical datasets with Zipf-distributed rules. Performance scales as a power law of training examples, providing insights into rare event impacts on learning dynamics.

Courses Taken

- Statistical Physics 3,4 (Graduate)
- Statistical Physics of Computation (by Florent Krzakala)
- Machine Learning for Physicists (by Lenka Zdeborova)
- Quantum Field Theory
- Differential Geometry (focused on smooth manifolds)
- Natural Language Processing
- Graph Neural Networks