Jimmy Hyun Jin Kim

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jimmy-hyun-jin-kim

Education

2015–2020 **Northwestern University**, Evanston, IL.
PhD, Physics
CGPA: 3.928

2011–2015 **University of Toronto**, Toronto, ON.
Honours BSc with High Distinction, Mathematics and Physics Specialist, Philosophy Minor
CGPA: 3.97

2017–2020 Graduate Student Researcher, *Center for the Physics of Biological Function*, Princeton, NJ.

2017–2019 NSF Traineeship in Data-Driven Discovery (IDEAS), *Northwestern University*, Evanston, IL.

Experience

Dec 7 2020– **Research Scientist**, *Meta*, New York, NY.

- Pioneered and directed large scale ML model development process involving 10+ engineers and research scientists. The resulting improvements in Instagram Shopping recommender system led to +10% weekly active visitors to Shopping Tab, +2% shopping activity on Feed, and additional $\$50$K daily GMV on Stories.
- Developed a business content distribution system to optimize the value derived by businesses from C2B interactions on Instagram Stories. Estimated long-term increase in advertiser spending on the platform, which was the ultimate aim of the project, corresponded to $+\$172.27$M annualized revenue.
- Utilized precision-recall analysis to develop a privacy-preserving ML model for optimizing user engagement on Instagram Stories. This led to growth in user engagement with decreased data privacy risk.

Fall 2019 **Data Science Intern**, *Uber*, San Francisco, CA.

- Developed a document content extraction pipeline for Customer Obsession team. This involved implementing and testing various tools and techniques for computer vision tasks such as image registration, text detection, optical character recognition, and barcode decoding.

Summer 2019 **Software Engineer Intern**, *Facebook*, New York, NY.

- Developed a cluster analysis pipeline for Marketing Intelligence team and utilized Wasserstein metric to generate natural language descriptions of the results.
- Created tools for understanding and interpreting supervised model predictions using model distillation techniques such as LIME.

2015–2020 **Graduate Research Assistant**, *Northwestern University*, Evanston, IL.

- Used statistical inference techniques such as MLE to both analytically and numerically determine optimal scaling relations of model sensory and memory networks.
- Developed an efficient implementation of the maximally informative dimensions method of neural response analysis based on variatonal lower bounds of mutual information.
- Developed a platform for multi-agent reinforcement learning in game theory setting and characterized the dynamical landscape in terms of the exploration-exploitation tradeoff parameter.
- Implemented a reinforcement learning inspired framework for active learning in language modelling.

Publications

2020 **J.H.J. Kim**, Ila Fiete, David J. Schwab. *Superlinear Precision and Memory in Simple Population Codes*, arXiv:2008.00629

2016 I. Kotera, N.A. Tran, D. Fu, **J.H.J. Kim**, J.B. Rodgers, W.S. Ryu. *Pan-neuronal screening in Caenorhabditis elegans reveals assymetric dynamics of AWC neurons is critical for thermal avoidance behavior*, eLife **5**, e19021

Thesis

2020 **H.J. Kim**. *Design and Analysis of Neural Networks Using Information*. Northwestern University.

Posters

2019 C. van der Poel, **J. Kim**, D. Schwab. *Control theory for multi-agent battle arena*. 120th Topical Symposium of the APS New York State Section: Physics of Artificial Intelligence, Yorktown Heights, NY.

2019 **J. Kim**, D. Shams, D. Schwab. *Dynamics of Multi-Agent Reinforcement Learning*. Dynamics Days 2019: International Conference on Nonlinear Dynamics, Evanston, IL.

Presentations

2020 **J. Kim**, D. Schwab. *Scalable maximally informative dimensions analysis of deep neural networks*. APS March Meeting, Denver, CO.

2019 **H.J. Kim**, D. Shams, D. Schwab. *Dynamics of Reinforcement Learning in Game Theory*. APS March Meeting, Boston, MA.

2018 **J. Kim**, *Optimizing neural coding and short term memory*. ITS Informal Seminar, New York, NY.

2018 **H.J. Kim**, I. Fiete, D. Schwab. *Optimizing population coding with unimodal tuning curves and short-term memory in continuous attractor networks*. APS March Meeting, Los Angeles, CA.

2018 **J. Kim**. *Optimal neural coding and short term memory*. SIAM Bridging the Gap Seminar, Evanston, IL.

2017 **J. Kim**. *Too much precision can be bad*. Seven Minutes of Science Symposium, Evanston, IL.

Languages

fluent English, Korean, Python, SQL, MATLAB

familiar C++, Lua, HTML, CSS, JavaScript, R, Mathematica