MITCH HILL

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EDUCATION

University of California, Los Angeles September 2014 - present
Ph.D. Statistics (expected June 2020)
Dissertation: Learning and mapping energy functions of high-dimensional data.
Committee: Song-Chun Zhu, Ying Nian Wu, Qing Zhou, and Guido Montufar.

University of Chicago September 2011 - June 2014
BSc. Mathematics and BA. Statistics

RESEARCH AREAS

I Energy landscape mapping (identifying macroscopic structures of highly non-convex functions)
II High-dimensional unsupervised learning (synthesis of realistic images, unsupervised clustering)
III Metastability and emergentism (Hopfield memory, neurological attractor dynamics, protein folding)
IV Markov chain Monte Carlo (Langevin dynamics and HMC, latent space sampling)
V Deep learning (loss surfaces of deep networks, unsupervised deep learning, adversarial perturbation)

PUBLICATIONS

Building a Telescope to Look into High-Dimensional Image Spaces. Mitch Hill, Erik Nijkamp, and Song-Chun Zhu. Quarterly of Applied Mathematics. 77(2): 269-321. 2019.

On Learning Non-convergent Non-persistent Short-run MCMC Toward Energy-Based Model. Erik Nijkamp, Mitch Hill, Song-Chun Zhu, and Ying Nian Wu. NeurIPS. 2019 (*forthcoming*).

Divergence Triangle for Joint Training of Generator Model, Energy-Based Model, and Inference Model. Tian Han, Erik Nijkamp, Xiaolin Fang, Mitch Hill, Song-Chun Zhu, and Ying Nian Wu. CVPR. 2019.

Monte Carlo Methods. Adrian Barbu and Song-Chun Zhu (*Mitch Hill credited as contributing author for Chapters 9, 10, and 11*). Springer Singapore. 2019 (*forthcoming*).

PRE-PRINTS

On the Anatomy of MCMC-based Maximum Likelihood Learning of Energy-Based Models. Erik Nijkamp*, Mitch Hill*, Tian Han, Song-Chun Zhu, and Ying Nian Wu (**equal contributors*). arXiv preprint arXiv:1903.12370.

AWARDS AND GRANTS

UCLA Dissertation Year Fellowship ($38,000). Award to support final year of dissertation. Fall 2019 – present.

Extreme Science and Engineering Discovery Environment (XSEDE) ASC170063 (100,000 GPU hours). Grant for computing resources to support intensive deep learning projects. 2018 – present.

TEACHING EXPERIENCE

Undergraduate Level Teaching Assistant
Introduction to Statistical Reasoning (STATS 10). Winter 2016, Spring 2016.
Design and Analysis of Experiments (STATS 101B). Winter 2017.
Introduction to Computational Statistics with R (STATS 102A). Winter 2019.

Graduate Level Teaching Assistant
Monte Carlo Methods for Optimization (STATS 202C). Spring 2016, 2017, 2018, and 2019.
Research Design, Sampling, and Analysis (STATS 201A). Fall 2017 and Fall 2018.
High-Dimensional Statistics (STATS 200C). Spring 2019.

TECHNICAL SKILLS

Languages & Software Python (Pytorch and Tensorflow), MATLAB, R, C, LaTeX