

JULES BERMAN

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Summary

Fourth year PhD Student in computer science with focus on methods for nonlinear model reduction of high dimensional time-dependent systems using neural networks and probabilistic transport models..

Education

B.S. New York University.

Graduation 2017

Major: Computer Science

Awards: cum laude

Ph.D. Courant Institute of Mathematical Sciences, New York University.

Expected 2025

Major: Computer Science

Advisor: Benjamin Peherstorfer

Awards: Harold Grad Memorial Prize, Maccracken Fellowship

Select Publications

Randomized Sparse Neural Galerkin Schemes with Deep Networks

[*spotlight*] NeurIPS 2023

[arxiv] **J Berman**, B Peherstorfer.

CoLoRA: Continuous low-rank adaptation for reduced neural modeling [...]

ICML 2024

[arxiv] **J Berman**, B Peherstorfer.

Representational Dissimilarity Metric Spaces for Stochastic Neural Networks

ICLR 2023

[arxiv] L Duong, J Nassar, J Zhou, **J Berman**, J Olieslagers, A Williams.

Parametric model reduction of [...] stochastic systems via higher-order action matching

[*in review*] NeurIPS 2024

J Berman, T Blickhan, B Peherstorfer.

Experience

Meta

May 2024 - Aug 2024

Research Scientist Intern, CTRL-Labs

Improved EMG classification model using contrastive learning contributing to a 10% increase in accuracy.

Built infrastructure tools to increase visibility into model failure modes.

Flatiron Institute

May 2021 - Aug 2022

Research Analyst, Center for Computational Neuroscience

Developed a deep learning method to segment 3D brain images using video Transformer architectures.

Built a software platform to train deep networks at scale. Trained 100k+ models, and built tools for analysis.

Bloomberg LP

April 2018 - April 2021

Senior Software Engineer, Global Infrastructure Team

Maintained the full stack of a company-wide infrastructure procurement web application.

Built a machine learning model which used historical data to project future infrastructure usage.

Skills

Machine learning, diffusion models, numerical analysis, computational neuroscience, nonlinear model reduction
Python, Jax, Pytorch, Tensorflow, NumPy, Matlab, SLURM

Publications

1. **J Berman**, T Blickhan, B Peherstorfer. (2024). Parametric model reduction of mean-field and stochastic systems via higher-order action matching.
2. **J Berman**, B Peherstorfer. (2024). CoLoRA: Continuous low-rank adaptation for reduced implicit neural modeling of parameterized partial differential equations. *International Conference on Machine Learning (ICML)*.
3. **J Berman**, P Schwerdtner, B Peherstorfer. (2024). Neural Galerkin schemes for sequential-in-time solving of partial differential equations with deep networks. *Numerical Analysis Meets Machine Learning*.
4. **J Berman**, S Golkar, D Lipshutz, R M Haret, T Gollisch, DB Chklovskii. (2024). Neuronal temporal filters as normal mode extractors. *Physical Review Research*.
5. **J Berman**, P Schwerdtner, B Peherstorfer. (2024). P Schwerdtner, P Schulze, J Berman, B Peherstorfer. (2023). *SIAM Journal on Scientific Computing (SISC)*.
6. **J Berman**, B Peherstorfer. (2023). Randomized sparse neural galerkin schemes for solving evolution equations with deep networks. *Advances in Neural Information Processing Systems (NeurIPS — Spotlight)*.
7. LR Duong, J Zhou, J Nassar, **J Berman**, J Olieslagers, AH Williams. (2023). Representational dissimilarity metric spaces for stochastic neural networks. *International Conference on Learning Representations (ICLR)*.
8. **J Berman**, DB Chklovskii, J Wu. (2023). Bridging the Gap: Point Clouds for Merging Neurons in Connectomics. *International Conference on Medical Imaging with Deep Learning (MIDL)*.