Denali Molitor

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Education

University of California, Los Angeles

Doctor of Philosophy in Mathematics — December 2020

Master of Arts in Mathematics — June 2018

Colorado College

Bachelor of Arts in Mathematics, summa cum laude — May 2014

Technical Skills

Topic modeling	Python	Linux and macOS
Machine learning	C++	Technical communication
Optimization	MATLAB	Open source contributor
Quantization	Git	
Randomized algorithms		

Experience

TensorFlowLite Research Intern — Summer 2019

Google LLC

- Improved the accuracy of an int8 quantized MobileNetV3 to within 2% of the original float model's accuracy
- Built a Python tool for analyzing and visualizing quantization error propagation in TensorFlowLite models
- Implemented a scale adjustment in C++ to prevent overflow for various quantized models
- Analyzed causes of decreased model performance with post-training, integer quantization
- Provided C++ code reviews that were incorporated into team members' code submissions

Graduate Researcher — 2017 - 2020

University of California, Los Angeles, Department of Mathematics

- Completed research projects in interpretable machine learning, optimization, numerical linear algebra, and topic modeling that resulted in journal and conference publications (**NeurIPS, AAAI, AMOP**)
- Communicated results in oral presentations and poster presentations (**WiML, JMM, SIAM CSE**)
- Reviewed for journals and conferences (**AMC, NUMA, SIGPRO, JMIV, WiML**)
- Implemented experiments to test performance of proposed methods in Python and MATLAB
- Utilized git for version control and for collaborations
- Processed and analyzed numerical data and text data from Reddit and Twitter with Python

Coordinator, UCLA Women in Math and Women in Math Mentorship Program — 2017 - 2020

University of California, Los Angeles, Department of Mathematics

- Coordinated dinners with invited female speakers
- Organized events for the UCLA Women in Mathematics Mentorship Program
- Fostered community among female graduate and undergraduate students

Teaching

Teaching Assistant — 2016-2020

Mathematical Sciences Research Institute (MSRI)

- Graduate summer school on Representations of High-Dimensional Data

University of California, Los Angeles

- Courses: Numerical Analysis, Machine Learning, Intro. to Computing (C++), Mathematical Methods of Data Theory

Assistant Mentor, Research Experience for Undergraduates — Summers 2018, 2020

University of California, Los Angeles (UCLA)

- Mentored four teams of students in analyzing methods for studying Lyme disease patient surveys and documents from the California Innocence Project
- Teams inferred missing data in patient surveys, identified patient categories using nonnegative matrix factorization, predicted health outcomes, and analyzed documents using nonnegative matrix and tensor factorization variants

Publications

1. A. Ma and D. Molitor. "Randomized Kaczmarz for Tensor Linear Systems." arXiv preprint arXiv:2006.01246. Jun. 2020.
2. J. Moorman, T. Tu, D. Molitor, D. Needell. "Randomized Kaczmarz with averaging." BIT Numerical Mathematics, to appear 2020.
3. R. Gower, D. Molitor, J. Moorman, and D. Needell. "Adaptive sketch-and-project methods for solving linear systems." arXiv preprint arXiv:1909.03604 Sept. 2019
4. D. Molitor, D. Needell, R. Ward. "Bias of gradient descent for the hinge loss." Applied Mathematics and Optimization, Apr. 2020.
5. D. Molitor, D. Needell. "An iterative method for classification of binary data." Information and Inference: A Journal of the IMA. Apr. 2020.
6. M. Gao, J. Haddock, D. Molitor, D. Needell, E. Sadovnik, T. Will, R. Zhang. "Neural nonnegative matrix factorization for hierarchical multilayer topic modeling." Proc. IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP), Dec. 2019.
7. J. Haddock, D. Molitor, D. Needell, S. Sambandam, J. Song, and S. Sun. "On inferences from completed data." Proc. Information Theory and Approximation Workshop, Feb. 2019.
8. D. Molitor, D. Needell, A. Nelson, R. Saab, and P. Salanevich "Classification scheme for binary data with extensions" Chapter in *Compressed Sensing and its Applications*, Springer, 2019.
9. G. Plumb, D. Molitor, A. Talwalkar "Supervised local modeling for interpretability." Proc. Neural Information Processing Systems (NeurIPS), Dec. 2018.
10. D. Molitor, D. Needell. "Hierarchical classification using binary data." AAAI Magazine Special Issue on Deep Models, Machine Learning and Artificial Intelligence Applications in National and International Security, June 2018.
11. D. Molitor, D. Needell."Matrix completion for structured observations." Proc. Information Theory and Approximation, La Jolla CA, Feb. 2018.
12. R. Strichartz, N. Ott, D. Molitor. "Using peano curves to construct Laplacians on fractals," Fractals, Vol. 23, No. 4, Dec. 2015.
13. D. Molitor, M. Steel, A. Taylor, "The structure of symmetric N-player games when influence and independence collide," Advances in Applied Mathematics, Vol. 62, 15-40, Jan. 2015.
14. D. Maxin, L. Berec, A. Bingham, D. Molitor, J. Pattyson, "Is more better? Higher sterilization of infected hosts need not result in reduced pest population." J. Math. Biol, June 2014.