Denali Molitor

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Education

University of California, Los Angeles

Doctor of Philosophy in Mathematics — June 2020

Master of Arts in Mathematics — June 2018

Colorado College

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

Technical Skills

Programming Languages: Python (NumPy, Pandas, SciPy, Scikit-learn), C++, MATLAB
Research Interests: Machine Learning, Optimization, Quantization, Numerical Linear Algebra
Tools: Linux, macOS, Git, Azure

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 library 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 resulting in journal and conference publications (**NeurIPS, AAAI, AMOP**)
- Communicated results in oral presentations, and poster presentations (**WiML, JMM, SIAM CSE**)
- 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
- Worked both independently and on small teams
- Mentored three teams of students in developing methods to analyze Lyme disease patient surveys during a summer research program

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 Assistant — 2016-2018

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++)

Publications

1. D. Molitor, D. Needell, R. Ward. "Bias of gradient descent for the hinge loss." Applied Mathematics and Optimization, to appear 2020.
2. 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
3. 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), 2019.
4. 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.
5. J. Moorman, T. Tu, D. Molitor, D. Needell. "Randomized Kaczmarz with averaging." Proc. Information Theory and Approximation Workshop, Feb. 2019.
6. 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.
7. D. Molitor, D. Needell. "An iterative method for classification of binary data." arXiv preprint arXiv:1809.03041. Sept. 2018.
8. G. Plumb, D. Molitor, A. Talwalkar "Supervised local modeling for interpretability." Proc. Neural Information Processing Systems (NeurIPS), Dec. 2018.
9. 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.
10. D. Molitor, D. Needell."Matrix completion for structured observations." Proc. Information Theory and Approximation, La Jolla CA, Feb. 2018.
11. R. Strichartz, N. Ott, D. Molitor. "Using peano curves to construct Laplacians on fractals." Fractals, Vol. 23, No. 4, Dec. 2015.
12. 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.
13. 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." Journal of Mathematical Biology, Vol. 70, No. 6, June 2014.

Reviewer

Applied Mathematics and Computation
Numerical Algorithms
Journal of Mathematical Imaging and Vision
Women in Machine Learning Conference

Fellowships and Scholarships

Eugene-Cota Robles Fellowship, UCLA Graduate Division, $100,000
Charles E. Young and Sue K. Graduate Student Fellowship, UCLA Office of the Deans, $10,000
National Merit Scholar
Florian Cajori Excellence in Mathematics Award, Colorado College
Euclid Scholar, Colorado College $2000
Colorado College Leadership Scholarship, $40,000