Gregory Dexter

LinkedIn: https://www.linkedin.com/in/gregorydexter1/ Website: https://www.gregorydexter.com

EDUCATION & SKILLS

Purdue University Main Campus, West Lafayette, IN Ph.D. in Computer Science

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Bachelor of Science Majors: Honors-Mathematics; Honors-Statistics. Minor: Computer Science Study Abroad: Tsinghua University, Spring 2019

Programming Languages (Ordered by proficiency):

Python – (Numpy, Pandas, PyTorch, Scipy, Scikit-learn), C, Java.

EXPERIENCE

LinkedIn, Mountain View, CA

Applied Research Intern

- Characterized how optimizer dynamics affect generalization performance in overparameterized neural networks through large-scale experimentation relating variations of the optimizer with model sharpness and test accuracy
- Implemented neural net architectures and optimizers in PyTorch and trained models on LinkedIn's distributed systems
- Derived formal theoretical explanations for observed patterns between SGD hyperparameters and the trained model
- Communicated learnings to improve deep learning efforts at LinkedIn through cross-team presentations and by preparing a • manuscript for publication

Purdue University, West Lafayette, IN

Graduate Research Assistant

- Created and theoretically validated new algorithms in multiple application areas including optimization, matrix sparsification, inverse reinforcement learning, and clustering in the streaming setting
- Supported computational genomics projects by developing rigorous theoretical guidance for the development of new algorithms along with efficient numerical implementations providing a 25x speedup
- Coordinated with researchers across institutions to develop state-of-the-art algorithms for estimating eigenvalues of a matrix • with few entry queries under various computational models
- Advanced understanding of how randomization can be used to improve performance in quantization of regression models .

Sandia National Laboratories, West Lafayette, IN

Graduate Student Mentor

- Mentored a team of undergraduate students to develop a prototypical analytic toolkit in Python as part of a pipeline capable • of providing stream-lined data analysis of experimental wargame data
- Utilized best practices while developing the analytic toolkit, including using Kanban, Agile/Scrum methodology, and Git •
- Developed a novel strategy classification meta-algorithm which had 90% accuracy in synthetic experiments

Regenstrief Institute, Indianapolis, IN

Machine Learning Research Intern

- Presented these findings to over 400 professionals through talks at the AMIA and IMIA conferences •
- Applied natural language processing techniques (NLP) to free-text medical records to create a random forest classifier in Python capable of detecting whether a patient has tested positively for diseases tracked by the Indiana Health Department
- Created a generative adversarial neural network capable of generating statistically indistinguishable synthetic patient data • which enables training of downstream models while maintaining patient privacy

AWARDS & ACCOMPLISHMENTS

- Purdue Senior Achievement Award in Mathematics Honorary scholarship given to select math majors •
- Goldwater Nominee Nominated as one of four students from Purdue University for the national Goldwater scholarship
- Chinese Government Scholarship Received housing and a stipend from the Chinese government for academic excellence Nominated for Apple/Google Fellowships - One of two students nominated by Purdue University for each fellowship

August 2020 – March 2024 (Expected) GPA: 3.96/4.00

> August 2016 - May 2020 GPA: 3.90/4.00

May 2023 - September 2023

January 2021 (Ongoing)

August 2020 - May 2021

May 2018 - April 2020

PUBLICATIONS

Links to papers are on my website (www.gregorydexter.com) or Google Scholar.

(**) – Denotes alphabetical author ordering

Under Review/In Preparation:

Gregory Dexter, Borja Ocejo Elizondo, Sathiya Keerthi, Aman Gupta, Ayan Acharya, Rajiv Khanna. A Precise Characterization of SGD Stability Using Loss Surface Geometry.

Kayhan Behdin, Qingquan Song, Aman Gupta, Sathiya Keerthi, Ayan Acharya, Borja Ocejo Elizondo, **Gregory Dexter**, Rajiv Khanna, David Durfee, Rahul Mazumder. mSAM: Micro-Batch-Averaged Sharpness-Aware Minimization. Under Review

Myson Burch, Aritra Bose, **Gregory Dexter**, Laxmi Parida, & Petros Drineas. MaSk-LMM: A Matrix Sketching Framework for Linear Mixed Models in Association Studies. Under Review

Gregory Dexter, Rajiv Khanna, & Petros Drineas. Feature Space Sketching for Logistic Regression. Under Review

Published/Accepted:

(**) Rajarshi Bhattacharjee, Gregory Dexter, Cameron Musco, Archan Ray, & David Woodruff. Sublinear Time Deterministic Algorithms for Spectral Approximation. *To Appear at ITCS 2024*

(**) Gregory Dexter, Petros Drineas, David Woodruff, & Taisuke Yasuda. Sketching Algorithms for Sparse Dictionary Learning: PTAS and Turnstile Streaming. *To Appear at NeurIPS 2023*

(**) Rajarshi Bhattacharjee, Gregory Dexter, Petros Drineas, Cameron Musco & Archan Ray. Sublinear Time Eigenvalue Approximation via Random Sampling. *ICALP 2023*

Agniva Chowdhury, **Gregory Dexter**, Palma London, Haim Avron, & Petros Drineas. Faster Randomized Infeasible Interior Point Methods for Tall/Wide Linear Programs. *JMLR*

Gregory Dexter, Agniva Chowdhury, Haim Avron, & Petros Drineas. On the Convergence of Inexact Predictor-Corrector Methods for Linear Programming. *ICML 2022*. Selected for long presentation (2% acceptance rate)

Gregory Dexter, Kevin Bello, & Jean Honorio, (2021). Inverse Reinforcement Learning in the Continuous Setting with Formal Guarantees. *NeurIPS 2021*.

Eugenia Kontopoulou, **Gregory Dexter**, Wojciech Szpankowski, Ananth Grama, Petros Drineas, (2020). Randomized Linear Algebra Approaches to Estimate the Von Neumann Entropy of Density Matrices. *IEEE Transactions on Information Theory*.

Suranga Kasthurirathne, **Gregory Dexter**, & Shaun Grannis. (2021). Generative Adversarial Networks for Creating Synthetic Free-Text Medical Data: A Proposal for Collaborative Research and Re-use of Machine Learning Models. *AMIA 2021 Annual Symposium*.

Gregory Dexter, Shaun Grannis, Brian Dixon, & Suranga Kasthurirathne. (2020). Generalization of Machine Learning Approaches to Identify Notifiable Conditions from a Statewide Health Information Exchange. *AMIA 2020 Informatics Summit.*

Gregory Dexter, Suranga Kasthurirathne, Brian Dixon, & Shaun Grannis. (2019). Generalization of Machine Learning Approaches to Identify Notifiable Diseases Reported from a Statewide Health Information Exchange. *MEDINFO 2019 Conference Proceedings*.

Gregory Dexter, Shaun Grannis, & Suranga Kasthurirathne. (2019). Comparison of Free-Text Synthetic Data Produced by Three Generative Adversarial Networks for Collaborative Health Data Analytics. *AMIA 2019 Annual Symposium*.