Michael Menart

Curriculum Vitae

Postdoctoral Fellow at University of Toronto and Vector Institute
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Education

The Ohio State University - *PhD in Computer Science* 2019 - 2024
Advised by Raef Bassily

Case Western Reserve University - *BS in Computer Science* 2015 - 2019

Research

My research focuses on expanding the theoretical foundations of machine learning. More specifically, my aim is to use these insights to better design machine learning and optimization algorithms which operate under algorithmic constraints, such as privacy, stability, and fairness. The implementation of these algorithmic constraints in deep learning has been severely limited by the lack of existing theory. My research aims to both complete the picture of learning under constraints in more well understood settings, and additionally apply these insights in conjunction with advances in our understanding of modern methods to obtain new algorithms for trustworthy machine learning.

Publications *(Most author orderings chosen alphabetically. Asterisk indicates primary authors otherwise.)*

1. **Private Algorithms for Stochastic Saddle Points and Variational Inequalities: Beyond Euclidean Geometry**
   Raef Bassily, Cristóbal Guzman, Michael Menart. Neural Information Processing Systems (NeurIPS). December 2024.

2. **Public-data Assisted Private Stochastic Optimization: Power and Limitations**
   Enayat Ullah*, Michael Menart*, Raef Bassily, Cristóbal Guzman, Raman Arora. Neural Information Processing Systems (NeurIPS). December 2024.

3. **Differentially Private Non-Convex Optimization under the KL Condition with Optimal Rates**
   Michael Menart*, Enayat Ullah*, Raman Arora, Raef Bassily, Cristóbal Guzman. International Conference on Algorithmic Learning Theory (ALT) 2024.

4. **Differentially Private Algorithms for the Stochastic Saddle Point Problem with Optimal Rates for the Strong Gap**
   Raef Bassily, Cristóbal Guzman, **Michael Menart**. Conference on Learning Theory (COLT). July 2023.

5. **Faster Rates of Convergence to Stationary Points in Differentially Private Optimization**
   Raman Arora, Raef Bassily, Tomás Gonzalez, Cristóbal Guzman, **Michael Menart**, Enayat Ullah. International Conference on Machine Learning (ICML). July 2023.

6. **Differentially Private Generalized Linear Models Revisited**
   Raman Arora, Raef Bassily, Cristóbal Guzman, **Michael Menart,** Enayat Ullah. Neural Information Processing Systems (NeurIPS). November 2022.

7. **Differentially Private Stochastic Optimization: New Results in Convex and Non-Convex Settings**
   Raef Bassily, Cristóbal Guzman, **Michael Menart**. Conference on Neural Information Processing Systems (NeurIPS). December 2021.

Preprints

1. **Private Rate-Constrained Optimization with Applications to Fair Learning**
   Mohammad Yaghini*, Tudor Cebere*, **Michael Menart.** Aurélien Bellet, Nicolas Papernot.

Teaching Experience

Machine Learning - *Teaching Assistant* Spring 2022
Programming C++ - *Teaching Assistant* Spring 2020
Programming Tutor - *Individual Tutoring* Fall 2018

Work Experience

MIM Software Research Intern 2018-2019 (Summers)
Explored/implemented machine learning methods for medical imaging and NLP applications in Python.

Air Force Research Laboratory (AFRL) Intern 2013 - 2017 (Summers)
Implemented various projects in computer vision/deep learning in Python/C++.

Talks/Presentations

- Discussion moderator, AI Governance Mechanisms Workshop, April 2025
- Vector Institute, Tutorial on Mirror Descent, Feb 2025
- University of Toronto Theory Lunch Talks, "Lower Bound Techniques in Differential Privacy", Nov 2024
- Translational Data Analytics Institute Graduate Seminar Series, "The Role of Public Data in Private Machine Learning: Power and Limitations", 2024
- Boston Area Data Privacy Seminar, "The Complexity of Differentially Private Optimization for Machine Learning", Nov. 2023
- Optimization for Machine Learning Workshop, "Differentially Private Generalized Linear Models Revisited", *International Conference on Continuous Optimization (ICCOPT), 2022* (served as Session Chair)
- Poster and Video Presentation, "Faster Rates of Convergence to Stationary Points in Differentially Private Optimization", ICML, 2023
- Poster and Video Presentation, "Differentially Private Generalized Linear Models Revisited", NeurIPS, 2022
- Poster and Video Presentation, "Differentially Private Stochastic Optimization: New Results in Convex and Non-Convex Settings", NeurIPS, 2021

Reviewing

I have served on the program committee or provided reviews for various conferences and journals, including ALT, COLT, NeurIPS, ICML, ICLR, SIAM, SODA, JMLR, IEEE TDSC.