Yuansi Chen

CONTACT INFORMATION	Department of Mathematics ETH Zurich Rämistrasse 101, 8092 Zurich, Switzerland	*Office:* HG G 15.1 *E-mail:* yuansi.chen@stat.math.ethz.ch *Website:* https://people.math.ethz.ch/~chenyua

RESEARCH INTERESTS

statistical machine learning, Markov chain Monte Carlo algorithms, applied probability, high dimensional geometry, domain adaptation and statistical challenges that arise in computational neuroscience.

PROFESSIONAL EXPERIENCE

ETH, Zürich, Zürich, Switzerland Associate professor	Jan. 2024 - present
Duke University, North Carolina, USA Assistant professor	Mar. 2021 - Jan. 2024
ETH, Zürich, Zürich, Switzerland Postdoc researcher at ETH Foundations of Data Science *Advised by Prof. Dr. Peter Bühlmann*	Jul. 2019 - Feb. 2021

EDUCATION

University of California, Berkeley, California, USA PhD in Statistics *Advised by Prof. Dr. Bin Yu*	Sept. 2013 - Jul. 2019
École Polytechnique, Palaiseau, France Diplôme d'Ingénieur de l'École Polytechnique (B.Sc. or Eng. Deg. in Applied Mathematics)	Sept. 2010 - Jul. 2013
Lycée Hoche, Versailles, France Classe préparatoire aux grandes écoles	Aug. 2008 - Jul. 2010

JOURNAL PUBLICATIONS

[1] Wu, K., Schmidler, S. and Chen, Y., Minimax Mixing Time of the Metropolis-Adjusted Langevin Algorithm for Log-Concave Sampling. *Journal of Machine Learning Research (JMLR)*, 2022

[2] Chen, Y. and Bühlmann, P., Domain adaptation under structural causal models. *Journal of Machine Learning Research (JMLR)*, 2021

[3] Chen, Y., An almost constant lower bound of the isoperimetric coefficient in the KLS conjecture. *Geometric and Functional Analysis (GAFA)*, 2021.

[4] Chen, Y., Taeb, A. and Bühlmann, P., A Look at Robustness and Stability of ℓ_1-versus ℓ_0-Regularization: Discussion of Papers by Bertsimas et al. and Hastie et al. Statistical Science, 35(4), 2020

[5] Chen, Y., Dwivedi, R., Wainwright, M.J. and Yu, B., Fast mixing of Metropolized Hamiltonian Monte Carlo: Benefits of multi-step gradients. *Journal of Machine Learning Research (JMLR)*, 2020.

[6] Ma, Y.A., Chen, Y., Jin, C., Flammarion, N. and Jordan, M.I., Sampling can be faster than optimization. *Proceedings of the National Academy of Sciences (PNAS)*, 2019.

[7] Dwivedi, R.[†], Chen, Y.[†], Wainwright, M.J. and Yu, B., Log-concave sampling: Metropolis-Hastings algorithms are fast. *Journal of Machine Learning Research (JMLR)*, 2019.

[8] Chen, Y.[†], Dwivedi, R.[†], Wainwright, M.J. and Yu, B., Fast MCMC sampling algorithms on polytopes. *Journal of Machine Learning Research (JMLR)*, 2018. This journal submission is the longer version of the conference paper [3]. This work includes both the Vaidya walk and the new John walk.

CONFERENCE
PUBLICATIONS

[9] Chen, Y. and Eldan, R., Localization schemes: A framework for proving mixing bounds for Markov chains. *Foundations of Computer Science (FOCS)*, 2022.

[10] Chen, Y.[†], Dwivedi, R.[†], Wainwright, M.J. and Yu, B., Log-concave sampling: Metropolis-Hastings algorithms are fast! Extended abstract in: *Proceedings of the 31th Annual Conference on Learning Theory (COLT)*, 2018.

[11] Chen, Y.[†], Dwivedi, R.[†], Wainwright, M.J. and Yu, B., Vaidya walk: A sampling algorithm based on the volumetric barrier. In: *Communication, Control, and Computing (Allerton), 55th Annual Allerton Conference*, 2017.

[12] Chen, Y., Pehlevan, C. and Chklovskii, D.B., Self-calibrating neural networks for dimensionality reduction. In: *Signals, Systems and Computers, 50th Asilomar Conference*, 2016.

[13] Chen, Y., Mairal, J. and Harchaoui, Z., Fast and robust archetypal analysis for representation learning. In: *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2014.

PRE-PRINTS

[14] Wu, K., Chen, Y., Ha W. and Yu B., Prominent Roles of Conditionally Invariant Components in Domain Adaptation: Theory and Algorithms. 2023.
arXiv preprint arXiv:2309.10301

[15] Chen, Y. and Gatmiry, K., When does Metropolized Hamiltonian Monte Carlo provably outperform Metropolis-adjusted Langevin algorithm? 2023.
arXiv preprint arXiv:2304.04724

[16] Chen, Y. and Gatmiry, K., A Simple Proof of the Mixing of Metropolis-Adjusted Langevin Algorithm under Smoothness and Isoperimetry. 2023.
arXiv preprint arXiv:2304.04095

[17] Chen, Y. and Eldan, R., Hit-and-run mixing via localization schemes. 2022.
arXiv preprint arXiv:2212.00297

[18] Abbasi-Asl, R.[†], Chen, Y.[†], Bloniarz, A., Oliver, M., Willmore, B.D.B., Gallant, J.L. and Yu, B., The DeepTune framework for modeling and characterizing neurons in visual cortex area V4.

[19] Chen, Y., Jin, C. and Yu, B., Stability and Convergence Trade-off of Iterative Optimization Algorithms.

IN THE NEWS   Statistics Postdoc Tames Decades-Old Geometry Problem   Mar. 2021
    Article about my research on Quanta magazine

AWARDS   Sloan Research Fellowship   2023 - 2025

        NSF CAREER Award   2023 - 2024

        Ralph E. Powe Junior Faculty Enhancement Award   2023 - 2024

SPECIAL INVITED LECTURES	Simons Institute Breakthroughs lecture series	2021
	Nirenberg Lectures in Geometric Analysis	2021

TALKS	Localization schemes	Jan. 2024
	Invited talk at Joint Mathematics Meetings 2024	

When does Metropolized Hamiltonian Monte Carlo provably outperform Metropolis-adjusted Langevin algorithm?   Dec. 2023
Invited talk at CMStatistics 2023

Localization schemes   Dec. 2023
Invited talk at Flatiron Institute

Localization schemes and the mixing of hit-and-run   Dec. 2022
Invited talk at University of Washington

Localization schemes: A framework for proving mixing bounds for Markov chains   Sep. 2022
Invited talk at Georgia Tech Algorithm and Randomness Center (ARC) Colloquium

Stochastic Localization and Concentration Inequalities   Jun. 2022
Minitutorial given at SIAM Conference on Discrete Mathematics (DM22)

Localization schemes: A framework for proving mixing bounds for Markov chains   Jun. 2022
Invited talk at Sampling Methods and Inverse Problems conference at Duke University

An Almost Constant Lower Bound of the Isoperimetric Coeff in the KLS Conjecture   Apr. 2022
Invited talk at Young Mathematician Lecture Series at National University of Singapore (online)

Localization schemes: A framework for proving mixing bounds for Markov chains   Mar. 2022
Invited talk at BLISS seminar at UC Berkeley (online)

An Almost Constant Lower Bound of the Isoperimetric Coeff in the KLS Conjecture   Mar. 2022
Invited talk at University of Minnesota Twin Cities (online)

Domian Adaptation under Structural Causal Models   Mar. 2022
Foundations Of Stable, Generalizable And Transferable Statistical Learning workshop Mathematical Sciences Research Institute (MSRI), Berkeley (online)

Domian Adaptation under Structural Causal Models   Mar. 2022
Invited talk at Online Causal Inference Seminar

Minimax mixing time of MALA for log-concave sampling   Feb. 2022
Invited talk at University of Rutgers, Camden

An Almost Constant Lower Bound of the Isoperimetric Coeff in the KLS Conjecture   Dec. 2021
Invited talk at Convex Geometry and its Applications workshop at Oberwolfach (online)

Recent progress on the KLS conjecture and Bourgain's slicing problem   Oct. 2021
Invited talk at CRM Nirenberg Lectures in Geometric Analysis, Montreal (online)

An Almost Constant Lower Bound of the Isoperimetric Coeff in the KLS Conjecture   Oct. 2021
Invited talk at Applied Probability Seminar Series, Columbia University

A causal perspective on when domain adaptation algorithms succeed or fail   Sept. 2021
Invited talk at Wharton Statistics and Data Science Seminars, UPenn (online)

An Almost Constant Lower Bound of the Isoperimetric Coeff in the KLS Conjecture   Aug. 2021
Invited talk at Simons Institute Breakthroughs lecture series, Berkeley (online)

Recent progress on the KLS conjecture and Eldan's stochastic localization scheme   Apr. 2021
Invited talk at Seminar on stochastic processes, ETH Zurich (online)

Recent progress on the KLS conjecture and Eldan's stochastic localization scheme   Apr. 2021
Invited talk at University of Cambridge (online)

Recent progress on the KLS conjecture and Eldan's stochastic localization scheme   Mar. 2021
Invited talk at Beijing International Center for Mathematical Research

Recent progress on the KLS conjecture and Eldan's stochastic localization scheme   Jan. 2021
Invited talk at the applied math and analysis seminar, Duke University (online)

Recent progress on the KLS conjecture and Eldan's stochastic localization scheme   Jan. 2021
Invited talk at the combinatorics seminar, University of Bristol (online)

Recent progress on the KLS conjecture and the stochastic localization scheme of Eldan   Jan. 2021
Invited talk at Online Asymptotic Geometric Analysis Seminar (online)

A Causal Perspective on Domain Adaptation   Jul. 2020
Joint Statistical Meetings (JSM 2020) (online)

The DeepTune framework for charactering V4 neurons in the visual cortex area V4   Jun. 2019
Invited talk at the Statistical Methods in Imaging conference (SMI 2019)

The DeepTune framework for charactering V4 neurons in the visual cortex area V4   Oct. 2018
Invited talk at Dicarlo Lab at MIT, Cambridge, MA

Stability and convergence trade-off of iterative algorithms   Sept. 2018
Invited talk at Matrix Computations and Scientific Computing Seminar, Berkeley, CA

Log-concave sampling: Metropolis-Hastings algorithms are fast   Jul. 2018
Conference on Learning Theory (COLT), Stockholm

Stability and convergence trade-off of iterative algorithms   Apr. 2018
Invited talk at Berkeley - Columbia Meeting in Engineering & Statistics, New York, NY

RESEARCH EXPERIENCE	**University of California, Berkeley**	California, USA
	Graduate Student Researcher	Aug. 2013 - Jul. 2019

Advised by Dr. Bin Yu. Developed stability-driven modeling and visualization algorithms in neuroscience. Established theoretical foundations on the trade-off between convergence and stability of iterative statistical learning algorithms. Designed and provided convergence guarantees for MCMC sampling algorithms.

Flatiron Institute of Simons Foundation	New York, USA
Research Internship	Jun. 2015 - Aug. 2015

Advised by Dr. Dmitri Chklovskii. Research on modeling adaptive dimension reduction of neuron computing.

LEAR Project Team at INRIA	Grenoble, France
Research Internship	Apr. 2013 - Aug. 2013

Advised by Dr. Julien Mairal and Dr. Zaid Harchaoui. Research on archetypal analysis for representation learning.

TEACHING EXPERIENCE	**Duke University**	North Carolina, USA
	Lecturer	

- Spring2022/2023-STA732: Statstical Inference

- Fall2021/2022-STA521L: Predictive modeling and statistical learning

University of California, Berkeley   California, USA
Teaching assistant   Spring 2019
Responsibilities included teaching discussion section 4 hours/week and creating homework.

- STAT 154: Modern Statistical Prediction and Machine Learning. Taught by Prof. Bin Yu.

University of California, Berkeley   California, USA
Teaching assistant   Fall 2016
Responsibilities included teaching discussion section 2 hours/week and creating homework on jupyter notebooks.

- STAT 215A: Statistical Models: Theory and Application. Taught by Prof. Philip B. Stark.

University of California, Berkeley   California, USA
Teaching assistant   Spring 2016
Responsibilities included teaching two discussion sections each of 2 hour/week and grading exams.

- STAT 135: Concepts of statistics. Taught by Prof. Helmut Pitters.

University of California, Berkeley   California, USA
Teaching assistant   Spring 2015
Responsibilities included teaching discussion section of 1 hour/week, creating homework, creating and grading exams.

- CS 280: Computer vision. Taught by Prof. Jitendra Malik.

PROFESSIONAL SERVICE

Associate editor
The Electronic Journal of Statistics (EJS)
Journal reviewer
Proceedings of the National Academy of Sciences (PNAS), Journal of Machine Learning Research, Machine Learning Journal, Bernoulli, Electronic Journal of Statistics, Statistical Science, IEEE Transactions on Signal Processing, Transactions on Mathematical Software
Conference reviewer
IEEE Symposium on Foundations of Computer Science (FOCS), International Conference on Machine Learning (ICML), Neural Information Processing Systems (NeurIPS), Conference on AI & Statistics (AISTATS), International Conference on Learning Representations (ICLR), Conference on Artificial Intelligence (AAAI), Conference on Uncertainty in Artificial Intelligence (UAI)
Department Service
Departmental seminar organizer (2021-2023), Computing committee member, Ph.D. dissertation committee advisor for Keru Wu, Ph.D. dissertation committee member for Yunran Chen and Joe Mathews, Master's in Statistical Science (MSS) portfolio committee in 2021 and 2022,