

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 <i>Advised by Prof. Dr. Peter Bühlmann</i>	Jul. 2019 - Feb. 2021
EDUCATION	University of California, Berkeley , California, USA PhD in Statistics <i>Advised by Prof. Dr. Bin Yu</i>	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	<p>[1] Wu, K., Schmidler, S. and Chen, Y., Minimax Mixing Time of the Metropolis-Adjusted Langevin Algorithm for Log-Concave Sampling. <i>Journal of Machine Learning Research (JMLR)</i>, 2022</p> <p>[2] Chen, Y. and Bühlmann, P., Domain adaptation under structural causal models. <i>Journal of Machine Learning Research (JMLR)</i>, 2021</p> <p>[3] Chen, Y., An almost constant lower bound of the isoperimetric coefficient in the KLS conjecture. <i>Geometric and Functional Analysis (GAFA)</i>, 2021.</p> <p>[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. <i>Statistical Science</i>, 35(4), 2020</p> <p>[5] Chen, Y., Dwivedi, R., Wainwright, M.J. and Yu, B., Fast mixing of Metropolized Hamiltonian Monte Carlo: Benefits of multi-step gradients. <i>Journal of Machine Learning Research (JMLR)</i>, 2020.</p> <p>[6] Ma, Y.A., Chen, Y., Jin, C., Flammarion, N. and Jordan, M.I., Sampling can be faster than optimization. <i>Proceedings of the National Academy of Sciences (PNAS)</i>, 2019.</p> <p>[7] Dwivedi, R.[†], Chen, Y.[†], Wainwright, M.J. and Yu, B., Log-concave sampling: Metropolis-Hastings algorithms are fast. <i>Journal of Machine Learning Research (JMLR)</i>, 2019.</p>	

[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

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 <i>Invited talk at Flatiron Institute</i>	Dec. 2023
Localization schemes and the mixing of hit-and-run <i>Invited talk at University of Washington</i>	Dec. 2022
Localization schemes: A framework for proving mixing bounds for Markov chains <i>Invited talk at Georgia Tech Algorithm and Randomness Center (ARC) Colloquium</i>	Sep. 2022
Stochastic Localization and Concentration Inequalities <i>Minitutorial given at SIAM Conference on Discrete Mathematics (DM22)</i>	Jun. 2022
Localization schemes: A framework for proving mixing bounds for Markov chains <i>Invited talk at Sampling Methods and Inverse Problems conference at Duke University</i>	Jun. 2022
An Almost Constant Lower Bound of the Isoperimetric Coeff in the KLS Conjecture <i>Invited talk at Young Mathematician Lecture Series at National University of Singapore (online)</i>	Apr. 2022
Localization schemes: A framework for proving mixing bounds for Markov chains <i>Invited talk at BLISS seminar at UC Berkeley (online)</i>	Mar. 2022
An Almost Constant Lower Bound of the Isoperimetric Coeff in the KLS Conjecture <i>Invited talk at University of Minnesota Twin Cities (online)</i>	Mar. 2022
Domian Adaptation under Structural Causal Models <i>Foundations Of Stable, Generalizable And Transferable Statistical Learning workshop Mathematical Sciences Research Institute (MSRI), Berkeley (online)</i>	Mar. 2022
Domian Adaptation under Structural Causal Models <i>Invited talk at Online Causal Inference Seminar</i>	Mar. 2022
Minimax mixing time of MALA for log-concave sampling <i>Invited talk at University of Rutgers, Camden</i>	Feb. 2022
An Almost Constant Lower Bound of the Isoperimetric Coeff in the KLS Conjecture <i>Invited talk at Convex Geometry and its Applications workshop at Oberwolfach (online)</i>	Dec. 2021
Recent progress on the KLS conjecture and Bourgain's slicing problem <i>Invited talk at CRM Nirenberg Lectures in Geometric Analysis, Montreal (online)</i>	Oct. 2021
An Almost Constant Lower Bound of the Isoperimetric Coeff in the KLS Conjecture <i>Invited talk at Applied Probability Seminar Series, Columbia University</i>	Oct. 2021
A causal perspective on when domain adaptation algorithms succeed or fail <i>Invited talk at Wharton Statistics and Data Science Seminars, UPenn (online)</i>	Sept. 2021
An Almost Constant Lower Bound of the Isoperimetric Coeff in the KLS Conjecture <i>Invited talk at Simons Institute Breakthroughs lecture series, Berkeley (online)</i>	Aug. 2021
Recent progress on the KLS conjecture and Eldan's stochastic localization scheme <i>Invited talk at Seminar on stochastic processes, ETH Zurich (online)</i>	Apr. 2021
Recent progress on the KLS conjecture and Eldan's stochastic localization scheme <i>Invited talk at University of Cambridge (online)</i>	Apr. 2021
Recent progress on the KLS conjecture and Eldan's stochastic localization scheme <i>Invited talk at Beijing International Center for Mathematical Research</i>	Mar. 2021
Recent progress on the KLS conjecture and Eldan's stochastic localization scheme <i>Invited talk at the applied math and analysis seminar, Duke University (online)</i>	Jan. 2021

Recent progress on the KLS conjecture and Eldan's stochastic localization scheme <i>Invited talk at the combinatorics seminar, University of Bristol (online)</i>	Jan. 2021
Recent progress on the KLS conjecture and the stochastic localization scheme of Eldan <i>Invited talk at Online Asymptotic Geometric Analysis Seminar (online)</i>	Jan. 2021
A Causal Perspective on Domain Adaptation <i>Joint Statistical Meetings (JSM 2020) (online)</i>	Jul. 2020
The DeepTune framework for charactering V4 neurons in the visual cortex area V4 <i>Invited talk at the Statistical Methods in Imaging conference (SMI 2019)</i>	Jun. 2019
The DeepTune framework for charactering V4 neurons in the visual cortex area V4 <i>Invited talk at Dicarolo Lab at MIT, Cambridge, MA</i>	Oct. 2018
Stability and convergence trade-off of iterative algorithms <i>Invited talk at Matrix Computations and Scientific Computing Seminar, Berkeley, CA</i>	Sept. 2018
Log-concave sampling: Metropolis-Hastings algorithms are fast <i>Conference on Learning Theory (COLT), Stockholm</i>	Jul. 2018
Stability and convergence trade-off of iterative algorithms <i>Invited talk at Berkeley - Columbia Meeting in Engineering & Statistics, New York, NY</i>	Apr. 2018

RESEARCH
EXPERIENCE

University of California, Berkeley <i>Graduate Student Researcher</i>	California, USA 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 <i>Research Internship</i>	New York, USA Jun. 2015 - Aug. 2015
Advised by Dr. Dmitri Chklovskii. Research on modeling adaptive dimension reduction of neuron computing.	
LEAR Project Team at INRIA <i>Research Internship</i>	Grenoble, France Apr. 2013 - Aug. 2013
Advised by Dr. Julien Mairal and Dr. Zaid Harchaoui. Research on archetypal analysis for representation learning.	

TEACHING
EXPERIENCE

Duke University <i>Lecturer</i>	North Carolina, USA
<ul style="list-style-type: none"> • Spring2022-STA732: Statistical Inference • Fall2021/2022-STA521L: Predictive modeling and statistical learning 	
University of California, Berkeley <i>Teaching assistant</i>	California, USA Spring 2019
Responsibilities included teaching discussion section 4 hours/week and creating homework.	
<ul style="list-style-type: none"> • 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,