

## Yuansi Chen

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CONTACT INFORMATION	Department of Statistical Science Duke University Durham, NC 27708, USA	Office: 223B E-mail: <a href="mailto:yuansi.chen@duke.edu">yuansi.chen@duke.edu</a> Website: <a href="http://www2.stat.duke.edu/~yc443">http://www2.stat.duke.edu/~yc443</a>
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	<b>Duke University</b> , North Carolina, USA Assistant professor	Mar. 2021 - present
	<b>ETH, Zurich</b> , Zurich, Switzerland Postdoc researcher at ETH Foundations of Data Science Advised by Prof. Dr. Peter Bühlmann	Jul. 2019 - Feb. 2021
EDUCATION	<b>University of California, Berkeley</b> , California, USA PhD in Statistics Advised by Prof. Dr. Bin Yu	Sept. 2013 - Jul. 2019
	<b>École Polytechnique</b> , Palaiseau, France Diplôme d'Ingénieur de l'École Polytechnique (B.Sc. or Eng. Deg. in Applied Mathematics)	Sept. 2010 - Jul. 2013
	<b>Lycée Hoche</b> , Versailles, France Classe préparatoire aux grandes écoles	Aug. 2008 - Jul. 2010
JOURNAL PUBLICATIONS	<p>[1] Chen, Y. and Bühlmann, P., Domain adaptation under structural causal models. <i>Journal of Machine Learning Research (JMLR)</i>, 2021</p> <p>[2] 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>[3] Chen, Y., Taeb, A. and Bühlmann, P., A Look at Robustness and Stability of <math>\ell_1</math>-versus <math>\ell_0</math>-Regularization: Discussion of Papers by Bertsimas et al. and Hastie et al. <i>Statistical Science</i>, 35(4), 2020</p> <p>[4] 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>[5] 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>[6] Dwivedi, R.<sup>†</sup>, Chen, Y.<sup>†</sup>, Wainwright, M.J. and Yu, B., Log-concave sampling: Metropolis-Hastings algorithms are fast. <i>Journal of Machine Learning Research (JMLR)</i>, 2019.</p> <p>[7] Chen, Y.<sup>†</sup>, Dwivedi, R.<sup>†</sup>, Wainwright, M.J. and Yu, B., Fast MCMC sampling algorithms on polytopes. <i>Journal of Machine Learning Research (JMLR)</i>, 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.</p>	

- CONFERENCE PUBLICATIONS
- [8] Chen, Y.<sup>†</sup>, Dwivedi, R.<sup>†</sup>, 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.
  - [9] Chen, Y.<sup>†</sup>, Dwivedi, R.<sup>†</sup>, 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.
  - [10] Chen, Y., Pehlevan, C. and Chklovskii, D.B., Self-calibrating neural networks for dimensionality reduction. In: *Signals, Systems and Computers, 50th Asilomar Conference*, 2016.
  - [11] 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
- [12] Chen, Y. and Eldan, R., Localization schemes: A framework for proving mixing bounds for Markov chains. 2022. Accepted in *Foundations of Computer Science (FOCS)*.  
*arXiv preprint arXiv:2203.04163*
  - [13] Wu, K., Schmidler, S. and Chen, Y., Minimax Mixing Time of the Metropolis-Adjusted Langevin Algorithm for Log-Concave Sampling. Accepted in *Journal of Machine Learning Research (JMLR)*.  
*arXiv preprint arXiv:2109.13055*
  - [14] Abbasi-Asl, R.<sup>†</sup>, Chen, Y.<sup>†</sup>, 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.
  - [15] 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 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 <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 &amp; Statistics, New York, NY</i>	Apr. 2018

RESEARCH EXPERIENCE	<p><b>University of California, Berkeley</b> <span style="float: right;">California, USA</span>  <i>Graduate Student Researcher</i> <span style="float: right;">Aug. 2013 - Jul. 2019</span>          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.</p> <p><b>Flatiron Institute of Simons Foundation</b> <span style="float: right;">New York, USA</span>  <i>Research Internship</i> <span style="float: right;">Jun. 2015 - Aug. 2015</span>          Advised by Dr. Dmitri Chklovskii. Research on modeling adaptive dimension reduction of neuron computing.</p> <p><b>LEAR Project Team at INRIA</b> <span style="float: right;">Grenoble, France</span>  <i>Research Internship</i> <span style="float: right;">Apr. 2013 - Aug. 2013</span>          Advised by Dr. Julien Mairal and Dr. Zaid Harchaoui. Research on archetypal analysis for representation learning.</p>
TEACHING EXPERIENCE	<p><b>Duke University</b> <span style="float: right;">North Carolina, USA</span>  <i>Lecturer</i></p> <ul style="list-style-type: none"> <li>• Spring2022-STA732: Statistical Inference</li> <li>• Fall2021/2022-STA521L: Predictive modeling and statistical learning</li> </ul> <p><b>University of California, Berkeley</b> <span style="float: right;">California, USA</span>  <i>Teaching assistant</i> <span style="float: right;">Spring 2019</span>          Responsibilities included teaching discussion section 4 hours/week and creating homework.</p> <ul style="list-style-type: none"> <li>• STAT 154: Modern Statistical Prediction and Machine Learning. Taught by Prof. Bin Yu.</li> </ul> <p><b>University of California, Berkeley</b> <span style="float: right;">California, USA</span>  <i>Teaching assistant</i> <span style="float: right;">Fall 2016</span>          Responsibilities included teaching discussion section 2 hours/week and creating homework on jupyter notebooks.</p> <ul style="list-style-type: none"> <li>• STAT 215A: Statistical Models: Theory and Application. Taught by Prof. Philip B. Stark.</li> </ul> <p><b>University of California, Berkeley</b> <span style="float: right;">California, USA</span>  <i>Teaching assistant</i> <span style="float: right;">Spring 2016</span>          Responsibilities included teaching two discussion sections each of 2 hour/week and grading exams.</p> <ul style="list-style-type: none"> <li>• STAT 135: Concepts of statistics. Taught by Prof. Helmut Pitters.</li> </ul> <p><b>University of California, Berkeley</b> <span style="float: right;">California, USA</span>  <i>Teaching assistant</i> <span style="float: right;">Spring 2015</span>          Responsibilities included teaching discussion section of 1 hour/week, creating homework, creating and grading exams.</p> <ul style="list-style-type: none"> <li>• CS 280: Computer vision. Taught by Prof. Jitendra Malik.</li> </ul>
PROFESSIONAL SERVICE	<p><b>Journal reviewer</b>          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</p> <p><b>Conference reviewer</b>          International Conference on Machine Learning (ICML), Neural Information Processing Systems</p>

(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, 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 2021 and 2022,