

Niladri S. Chatterji

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Research Interests

Statistical Learning Theory, Markov Chain Monte Carlo Methods & Online Learning.

Education

PhD in Physics

August 2015 - Present

Advisors - [Peter L. Bartlett](#) (EECS/Statistics) and [Michael DeWeese](#) (Physics)

University of California Berkeley

Dual Degree (B.Tech + M.Tech) in Engineering Physics

June 2010 - July 2015

Minor in Electrical Engineering

Indian Institute of Technology Bombay

GPA: 9.40/10.00, Department Rank 1

Publications and Pre-Prints

In Computer Science and Statistics

- The intriguing role of module criticality in the generalization of deep networks
Niladri S. Chatterji, Behnam Neyshabur, Hanie Sedghi; *under review at ICLR 2020*.
- OSOM: A Simultaneously Optimal Algorithm for Multi-Armed and Linear Contextual Bandits
Niladri S. Chatterji, Vidya Muthukumar and Peter L. Bartlett; *under review at AISTATS 2019*.
- Langevin Monte Carlo without Smoothness
Niladri S. Chatterji*, Jelena Diakonikolas*, Michael I. Jordan and Peter L. Bartlett; *under review at AISTATS 2019*.
- Is There an Analog of Nesterov Acceleration for MCMC?
Yi-An Ma, Niladri S. Chatterji, Xiang Cheng, Nicolas Flammarion, Peter L. Bartlett and Michael Jordan; *under review at Bernoulli*.
- Sharp Convergence Rates for Langevin Dynamics in the Nonconvex Setting
Xiang Cheng, Niladri S. Chatterji, Yasin Abbasi-Yadkori, Peter L. Bartlett and Michael I. Jordan; *under review at Journal of Machine Learning Research*.
- Online Kernel Optimization
Aldo Pacchiano*, Niladri S. Chatterji*, Peter Bartlett; *Long Talk at ICML 2019*.
- On the Theory of Variance Reduction for Stochastic Gradient Monte Carlo
Niladri S. Chatterji, Nicolas Flammarion, Yi-An Ma, Peter L. Bartlett, Michael I. Jordan; *appeared in ICML 2018*.
- Underdamped Langevin MCMC: A non-asymptotic analysis
Xiang Cheng*, Niladri S. Chatterji*, Peter L. Bartlett, Michael I. Jordan; *appeared in COLT 2018*.
- Alternating minimization for dictionary learning: Local Convergence Guarantees
Niladri S. Chatterji, Peter L. Bartlett; *appeared in NIPS 2017*.

In Preparation

- Langevin meets LeCam: Oracle lower bounds for first-order stochastic gradient sampling methods
Niladri S. Chatterji, Peter L. Bartlett and Phil Long; *in preparation*.

In Physics

- Proposal for a spin-transfer torque device based on resonant tunneling
Niladri S. Chatterji, A. Tulapurkar and B. Muralidharan (APS March Meeting, 2015)

- Nanoscale-Magneto-resistance Sensors with enhanced sensitivity using resonant tunneling magnetic junctions - Niladri S. Chatterji, A. Sharma, A. Tulapurkar and B. Muralidharan, Proceedings of SSDM, Sapporo, Japan, (2015).
- Enhancement of Spin-transfer torque switching via resonant tunneling
Niladri S. Chatterji, A. Tulapurkar and B. Muralidharan. Applied Physics Letters Vol 105 Issue 25, 232410 (2014).
- N. Chatterji, A. Tulapurkar, B. Muralidharan. Resonant tunneling magnetic tunnel junction device. Indian Patent Application No. 3717/MUM/2014, filed November 2014. Patent Pending.

Advanced Courses Completed

Statistics: Theoretical Statistics (Michael Jordan), High dimensional Statistics (Martin Wainwright), Statistical Learning Theory (Peter L. Bartlett), Probability Theory (Jim Pitman and Steven Evans)

EECS: Deep Reinforcement Learning (Sergey Levine), Machine Learning in Social Dynamics (Moritz Hardt), Beyond Worst Case Analysis (Luca Trevisan), Convex Optimization (Ben Recht), Game Theory (Ankur Kulkarni), Complexity Theory (Prasad Raghavendra), Information Theory (Thomas Courtrade)

Physics: Non-equilibrium Statistical Mechanics, Quantum Field Theory and General Theory of Relativity.

Talks

1. The intriguing role of module criticality in the generalization of deep networks – Google Brain 2019.
2. Analysis of Markov Chain Monte Carlo Algorithms – Berkeley AI Retreat 2019.
3. Underdamped Langevin Markov Chain Monte Carlo – Simons Industry Day 2019.
4. Underdamped Langevin Markov Chain Monte Carlo – Simons Program on Foundations of Data Science Fall 2018.
5. Underdamped Langevin Markov Chain Monte Carlo – Midwest Machine Learning Symposium 2018.
6. Alternating minimization for dictionary learning: Local Convergence Guarantees – Berkeley AI Seminar 2017.

Academic Achievements

- *Ranked 1st* among the students in the dual degree programme in Engineering Physics at IIT Bombay
- Institute Academic Prizes: Awarded scholarships for Ranking 1st in my second, third and fourth year

Teaching Experience

I thoroughly enjoy teaching and have been a tutor for over 400 students. My duties included solving doubts in the subject matter, helping students develop problem solving skills and grading examination papers.

- TA for Physics 110 A at UC Berkeley Spring 2017 & Fall 2016
- TA for Physics 7B at UC Berkeley Fall 2015, Spring & Summer 2016
- TA for UG laboratory, Basic Electronics at IIT Bombay Autumn 2014
- TA for UG course, Electricity and Magnetism at IIT Bombay Spring 2013
- TA for UG course, Quantum Physics at IIT Bombay Autumn 2013
- TA for UG course, Intro to Numerical Analysis at IIT Bombay Summer 2012

Skill Set

Coding Skills : Comfortable working with Python, PyTorch, Tensorflow, MATLAB and C++.

Languages : Fluent in English, Hindi and Bengali. Beginner level knowledge of Marathi.