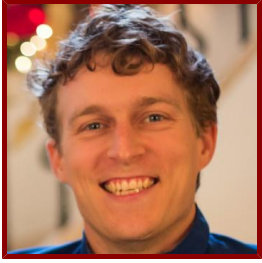


Stanford



John Duchi

Associate Professor of Statistics, of Electrical Engineering and, by courtesy, of Computer Science

Bio

BIO

John Duchi (<http://web.stanford.edu/~jduchi/>) is an assistant professor of Statistics and Electrical Engineering and (by courtesy) Computer Science at Stanford University. His work spans statistical learning, optimization, information theory, and computation, with a few driving goals. (1) To discover statistical learning procedures that optimally trade between resources--computation, communication, privacy provided to study participants--while maintaining good statistical performance. (2) To build efficient large-scale optimization methods that address the spectrum of optimization, machine learning, and data analysis problems we face, allowing us to move beyond bespoke solutions to methods that robustly work. (3) To develop tools to assess and guarantee the validity of--and confidence we should have in--machine-learned systems.

ACADEMIC APPOINTMENTS

- Associate Professor, Statistics
- Associate Professor, Electrical Engineering
- Associate Professor (By courtesy), Computer Science
- Member, Bio-X

HONORS AND AWARDS

- SIAM/OPT Early Career Prize, Society for Industrial and Applied Mathematics, Optimization Group (2020)
- Young Investigator Award, Office of Naval Research (2019)
- Best Paper Award, Neural Information Processing Systems (2017)
- Sloan Foundation Fellow in Mathematics, Sloan Foundation (2016)
- Doctoral Dissertation Award (Honorable Mention), Association for Computing Machinery (2015)
- Okawa Foundation Award, Okawa Foundation (2015)
- C.V. Ramamoorthy Distinguished Research Award, University of California, Berkeley (2014)
- Best Student Paper Award, International Conference on Machine Learning (2010)

PROFESSIONAL EDUCATION

- BS, Stanford University , Computer Science (2007)
- MS, Stanford University , Computer Science (2008)
- MA, University of California, Berkeley , Statistics (2012)
- PhD, University of California, Berkeley , EECS (2014)

LINKS

- Homepage: <http://web.stanford.edu/~jduchi/>
- Google Scholar Page: <https://scholar.google.com/citations?hl=en&user=i5srt20AAAAJ>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My work spans statistical learning, optimization, information theory, and computation, with a few driving goals: 1. To discover statistical learning procedures that optimally trade between real-world resources while maintaining statistical efficiency. 2. To build efficient large-scale optimization methods that move beyond bespoke solutions to methods that robustly work. 3. To develop tools to assess and guarantee the validity of—and confidence we should have in—machine-learned systems.

Teaching

COURSES

2025-26

- Information Theory and Statistics: EE 377, STATS 311 (Aut)
- Introduction to Probability Theory: STATS 117 (Spr)

2024-25

- Introduction to Matrix Methods: ENGR 108 (Aut)
- Introduction to Probability Theory: STATS 117 (Aut)
- Modern Applied Statistics: Learning: STATS 315A (Win)

2023-24

- Information Theory and Statistics: EE 377, STATS 311 (Aut)
- Introduction to Matrix Methods: ENGR 108 (Aut)
- Mathematics of Convexity: EE 364M (Win)
- Modern Applied Statistics: Learning: STATS 315A (Win)

2022-23

- Applied Statistics I: STATS 305A (Aut)
- Introduction to Matrix Methods: ENGR 108 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Sungyoon Kim, Basil Saeed, Fangzhao Zhang, Yifan Zhu

Orals Chair

Aishwarya Mandyam, Rohan Yadav

Doctoral Dissertation Advisor (AC)

Felipe Areces, Nicole Meister, Malo Sommers

Orals Evaluator

Timothy Sudijono

Master's Program Advisor

George Davis, #mar Halldórsson, Yiling Huang, Apollo Lee, John Siddiqui

Doctoral (Program)

Felipe Areces, Lindsey Canessa, Andy Dong, Saminul Haque, Rohith Kudritipudi, Christopher Mohri, Pratik Rathore, Audrey Xie, Fangzhao Zhang

Publications

PUBLICATIONS

- **THE RIGHT COMPLEXITY MEASURE IN LOCALLY PRIVATE ESTIMATION: IT IS NOT THE FISHER INFORMATION** *ANNALS OF STATISTICS*
Duchi, J. C., Ruan, F.
2024; 52 (1): 1-51
- **Robust Validation: Confident Predictions Even When Distributions Shift** *JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION*
Cauchois, M., Gupta, S., Ali, A., Duchi, J. C.
2024
- **Predictive Inference with Weak Supervision** *JOURNAL OF MACHINE LEARNING RESEARCH*
Cauchois, M., Gupta, S., Ali, A., Duchi, J.
2024; 25
- **BOUNDS ON THE CONDITIONAL AND AVERAGE TREATMENT EFFECT WITH UNOBSERVED CONFOUNDING FACTORS** *ANNALS OF STATISTICS*
Yadlowsky, S., Namkoong, H., Basu, S., Duchi, J., Tian, L.
2022; 50 (5): 2587-2615
- **BOUNDS ON THE CONDITIONAL AND AVERAGE TREATMENT EFFECT WITH UNOBSERVED CONFOUNDING FACTORS.** *Annals of statistics*
Yadlowsky, S., Namkoong, H., Basu, S., Duchi, J., Tian, L.
2022; 50 (5): 2587-2615
- **Distributionally Robust Losses for Latent Covariate Mixtures** *OPERATIONS RESEARCH*
Duchi, J., Hashimoto, T., Namkoong, H.
2022
- **Mean Estimation From One-Bit Measurements** *IEEE TRANSACTIONS ON INFORMATION THEORY*
Kipnis, A., Duchi, J. C.
2022; 68 (9): 6276-6296
- **Lower bounds for non-convex stochastic optimization** *MATHEMATICAL PROGRAMMING*
Arjevani, Y., Carmon, Y., Duchi, J. C., Foster, D. J., Srebro, N., Woodworth, B.
2022
- **Accelerated, Optimal and Parallel: Some results on model-based stochastic optimization**
Chadha, K., Cheng, G., Duchi, J.
edited by Chaudhuri, K., Jegelka, S., Song, L., Szepesvari, C., Niu, G., Sabato, S.
JMLR-JOURNAL MACHINE LEARNING RESEARCH.2022
- **Private optimization in the interpolation regime: faster rates and hardness results**
Asi, H., Chadha, K., Cheng, G., Duchi, J.
edited by Chaudhuri, K., Jegelka, S., Song, L., Szepesvari, C., Niu, G., Sabato, S.
JMLR-JOURNAL MACHINE LEARNING RESEARCH.2022
- **Statistics of Robust Optimization: A Generalized Empirical Likelihood Approach** *MATHEMATICS OF OPERATIONS RESEARCH*
Duchi, J. C., Glynn, P. W., Namkoong, H.
2021; 46 (3): 946-969
- **LEARNING MODELS WITH UNIFORM PERFORMANCE VIA DISTRIBUTIONALLY ROBUST OPTIMIZATION** *ANNALS OF STATISTICS*
Duchi, J. C., Namkoong, H.

2021; 49 (3): 1378-1406

- **ASYMPTOTIC OPTIMALITY IN STOCHASTIC OPTIMIZATION** *ANNALS OF STATISTICS*
Duchi, J. C., Ruan, F.
2021; 49 (1): 21–48
- **Lower bounds for finding stationary points II: first-order methods** *MATHEMATICAL PROGRAMMING*
Carmon, Y., Duchi, J. C., Hinder, O., Sidford, A.
2021; 185 (1-2): 315–55
- **Knowing what You Know: valid and validated confidence sets in multiclass and multilabel prediction** *JOURNAL OF MACHINE LEARNING RESEARCH*
Cauchois, M., Gupta, S., Duchi, J. C.
2021; 22
- **Private Adaptive Gradient Methods for Convex Optimization**
Asi, H., Duchi, J., Fallah, A., Javidbakht, O., Talwar, K.
edited by Meila, M., Zhang, T.
JMLR-JOURNAL MACHINE LEARNING RESEARCH.2021
- **A constrained risk inequality for general losses**
Duchi, J., Ruan, F.
edited by Banerjee, A., Fukumizu, K.
MICROTOME PUBLISHING.2021
- **Misspecification in Prediction Problems and Robustness via Improper Learning**
Marsden, A., Duchi, J., Valiant, G.
edited by Banerjee, A., Fukumizu, K.
MICROTOME PUBLISHING.2021
- **Lower bounds for finding stationary points I** *MATHEMATICAL PROGRAMMING*
Carmon, Y., Duchi, J. C., Hinder, O., Sidford, A.
2020; 184 (1-2): 71–120
- **First-Order Methods for Nonconvex Quadratic Minimization** *SIAM REVIEW*
Carmon, Y., Duchi, J. C.
2020; 62 (2): 395–436
- **Solving (most) of a set of quadratic equalities: composite optimization for robust phase retrieval** *INFORMATION AND INFERENCE-A JOURNAL OF THE IMA*
Duchi, J. C., Ruan, F.
2019; 8 (3): 471–529
- **GRADIENT DESCENT FINDS THE CUBIC-REGULARIZED NONCONVEX NEWTON STEP** *SIAM JOURNAL ON OPTIMIZATION*
Carmon, Y., Duchi, J.
2019; 29 (3): 2146–78
- **The importance of better models in stochastic optimization.** *Proceedings of the National Academy of Sciences of the United States of America*
Asi, H. n., Duchi, J. C.
2019
- **Modeling simple structures and geometry for better stochastic optimization algorithms**
Asi, H., Duchi, J. C.
edited by Chaudhuri, K., Sugiyama, M.
MICROTOME PUBLISHING.2019
- **Necessary and Sufficient Geometries for Gradient Methods**
Levy, D., Duchi, J. C.
edited by Wallach, H., Larochelle, H., Beygelzimer, A., d'Alche-Buc, F., Fox, E., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2019

- **Unlabeled Data Improves Adversarial Robustness**
Carmon, Y., Raghunathan, A., Schmidt, L., Liang, P., Duchi, J. C.
edited by Wallach, H., Larochelle, H., Beygelzimer, A., d'Alche-Buc, F., Fox, E., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2019
- **Variance-based Regularization with Convex Objectives** *JOURNAL OF MACHINE LEARNING RESEARCH*
Duchi, J., Namkoong, H.
2019; 20
- **STOCHASTIC (APPROXIMATE) PROXIMAL POINT METHODS: CONVERGENCE, OPTIMALITY, AND ADAPTIVITY** *SIAM JOURNAL ON OPTIMIZATION*
Asi, H., Duchi, J. C.
2019; 29 (3): 2257–90
- **ACCELERATED METHODS FOR NONCONVEX OPTIMIZATION** *SIAM JOURNAL ON OPTIMIZATION*
Carmon, Y., Duchi, J. C., Hinder, O., Sidford, A.
2018; 28 (2): 1751–72
- **STOCHASTIC METHODS FOR COMPOSITE AND WEAKLY CONVEX OPTIMIZATION PROBLEMS** *SIAM JOURNAL ON OPTIMIZATION*
Duchi, J. C., Ruan, F.
2018; 28 (4): 3229–59
- **Scalable End-to-End Autonomous Vehicle Testing via Rare-event Simulation**
O'Kelly, M., Sinha, A., Namkoong, H., Duchi, J., Tedrake, R.
edited by Bengio, S., Wallach, H., Larochelle, H., Grauman, K., CesaBianchi, N., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2018
- **Generalizing to Unseen Domains via Adversarial Data Augmentation**
Volpi, R., Namkoong, H., Sener, O., Duchi, J., Murino, V., Savarese, S.
edited by Bengio, S., Wallach, H., Larochelle, H., Grauman, K., CesaBianchi, N., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2018
- **Analysis of Krylov Subspace Solutions of Regularized Nonconvex Quadratic Problems**
Carmon, Y., Duchi, J. C.
edited by Bengio, S., Wallach, H., Larochelle, H., Grauman, K., CesaBianchi, N., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2018
- **Minimax Optimal Procedures for Locally Private Estimation** *JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION*
Duchi, J. C., Jordan, M. I., Wainwright, M. J.
2018; 113 (521): 182–201
- **Minimax Optimal Procedures for Locally Private Estimation Rejoinder** *JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION*
Duchi, J. C., Jordan, M. I., Wainwright, M. J.
2018; 113 (521): 212–15
- **Mean Estimation from Adaptive One-bit Measurements**
Kipnis, A., Duchi, J. C., IEEE
IEEE.2017: 1000–1007
- **Variance-based Regularization with Convex Objectives**
Namkoong, H., Duchi, J. C.
edited by Guyon, Luxburg, U. V., Bengio, S., Wallach, H., Fergus, R., Vishwanathan, S., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2017
- **Unsupervised Transformation Learning via Convex Relaxations**
Hashimoto, T. B., Duchi, J. C., Liang, P.
edited by Guyon, Luxburg, U. V., Bengio, S., Wallach, H., Fergus, R., Vishwanathan, S., Garnett, R.
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- **Simultaneous dimension reduction and adjustment for confounding variation** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Lin, Z., Yang, C., Zhu, Y., Duchi, J., Fu, Y., Wang, Y., Jiang, B., Zamanighomi, M., Xu, X., Li, M., Sestan, N., Zhao, H., Wong, et al
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- **Divide and Conquer Kernel Ridge Regression: A Distributed Algorithm with Minimax Optimal Rates** *JOURNAL OF MACHINE LEARNING RESEARCH*
Zhang, Y., Duchi, J., Wainwright, M.
2015; 16: 3299-3340
- **Optimal Rates for Zero-Order Convex Optimization: The Power of Two Function Evaluations** *IEEE TRANSACTIONS ON INFORMATION THEORY*
Duchi, J. C., Jordan, M. I., Wainwright, M. J., Wibisono, A.
2015; 61 (5): 2788-2806
- **Dynamic Management of Network Risk from Epidemic Phenomena**
Sinha, A., Duchi, J., Bambos, N., IEEE
IEEE.2015: 1583–88
- **Privacy Aware Learning** *JOURNAL OF THE ACM*
Duchi, J. C., Jordan, M. I., Wainwright, M. J.
2014; 61 (6)
- **Privacy: a few definitional aspects and consequences for minimax mean-squared error**
Barber, R., Duchi, J., IEEE
IEEE.2014: 1365–69
- **THE ASYMPTOTICS OF RANKING ALGORITHMS** *ANNALS OF STATISTICS*
Duchi, J. C., Mackey, L., Jordan, M. I.
2013; 41 (5): 2292-2323