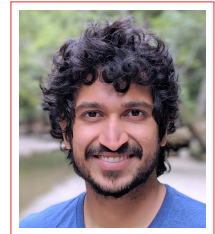


Aaditya K. Ramdas

Curriculum Vitae



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📁 stat.cmu.edu/~aramdas

Research summary

My research spans algorithms, theory and applications of statistical inference and machine learning:

- **reproducibility in science and technology**
 - controlling false discoveries in novel static and dynamic settings
 - structured multiple hypothesis testing under dependence
 - selective, simultaneous and post-hoc inference
- **active, sequential decision-making**
 - experimentation for online and streaming settings
 - human-in-the-loop interactive inference
 - large-scale A/B-testing, multi-armed bandits
- **assumption-light uncertainty quantification**
 - always-valid sequential confidence intervals, anytime p -values
 - conformal prediction sets, distribution-free calibration
 - game theoretic statistical inference via betting and e -values

Employment and Background

2022–	Visiting Academic, Amazon Research (AWS),	20%.
2024–	Associate Professor. Department of Statistics and Data Science (Dietrich College) Machine Learning Department (School of CS) Carnegie Mellon University (CMU), Pittsburgh (USA)	75%. 25%.
2018–24	Assistant Professor (affiliations same as above).	
2021–22	Bain Advisor Network, Bain & Company.	
Sum'2019	Visiting professor, Microsoft Research, <i>Montreal</i> .	
2015–18	Postdoctoral Researcher in EECS and Statistics. University of California, Berkeley (UCB), Berkeley (USA) Mentors: Michael I. Jordan & Martin J. Wainwright	
2010–15	MS+PhD in Statistics and Machine Learning. Carnegie Mellon University (CMU), Pittsburgh (USA) Advisors: Larry Wasserman & Aarti Singh	GPA 4.2/4
2009–10	Algorithmic financial trading, Tower Research Capital, (India+USA).	
2005–09	Bachelors in Computer Science and Engineering. Indian Institute of Technology (IIT), Bombay (India)	GPA 9.44/10, Rank 9/600, 3/60

Selected Awards and Honors

Excludes paper awards, which are mentioned along with the papers in the next section.

- 2024 Sloan Fellowship in Mathematics
- 2024 J Amer Stat Assoc, Discussion Paper
- 2023 IMS Peter Gavin Hall Early Career Prize
- 2023 J Royal Stat Soc Series B, Discussion Paper
- 2022 Google Research Scholar Award
- 2021 COPSS Emerging Leader Award

- 2020 NSF CAREER Award
- 2020 Bernoulli New Researcher Award
- 2019 Adobe Faculty Research Award

- 2025 Keynote speaker (out of 3), Vienna Congress on Math Finance (Austria)
- 2024 Keynote speaker (out of 2), Waterloo Student Conference (Canada)
- 2024 Invited lecture series (15 hrs), Columbia University (USA)
- 2024 Invited lecture series (6 hrs), Georgia Institute of Technology (USA)
- 2024 Keynote speaker (out of 3), AISTATS (Spain)
- 2023 Keynote speaker (out of 6), Lunteren Annual Meeting of Statisticians (Netherlands)
- 2023 Keynote speaker (out of 3), ELLIS workshop on Robust Machine Learning (Finland)
- 2023 Keynote speaker (out of 6), MobiliT.AI Conference on AI and Transportation (France)
- 2023 Keynote speaker, American Statistical Association, Pittsburgh Chapter (USA)
- 2022 Invited lecture series (3 hrs), CUSO Summer Stat/Prob Summer School (Switzerland)
- 2022 Invited tutorial, National Conference on Communications (India)
- 2021 Keynote speaker, CMU Sports Analytics Conference (USA)

- 2015 Umesh K. Gavaskar Memorial PhD Thesis Award, Department of Statistics, CMU
- 2015 Alan J. Perlis Graduate Student Teaching Award, School of Computer Science, CMU
- 2015 Mihaela Serban Memorial Award, American Statistical Association, Pittsburgh chapter
- 2015 Outstanding Representative Award, Graduate Student Assembly, CMU
- 2014 Graduate Student Teaching Award, Machine Learning Department, CMU
- 2013 Doug Beferman PhD Fellowship

- 2009 IIT Bombay Cultural Citation, highest honor for cultural accomplishments over 4 years
- 2006-09 Inlaks Full Scholarship, for best all-round student (academic+extra-curricular) in IIT Bombay
- 2005 Prime Minister's invitee to Republic Day Parade, for academic excellence*

IIT Joint Entrance Exam India Rank 47/400,000, *Central Board Exams 97.4%, India Rank 10/300,000

Published or accepted peer-reviewed journal papers

Hyperlinks to all papers (arXiv, proceedings, software) are available from my website publications page. They are omitted here for brevity.

- 67. 2025 The extended Ville's inequality for nonintegrable nonnegative supermartingales.
H. Wang, A. Ramdas Bernoulli
- 66. 2024 Randomized & exchangeable improvements of Markov, Chebyshev and Chernoff's inequalities.
A. Ramdas, T. Manole Statistical Science
- 65. 2024 On the existence of powerful p-values and e-values for composite hypotheses.
Z. Zhang, A. Ramdas, R. Wang Annals of Stat
- 64. 2024 Time-uniform central limit theory and asymptotic confidence sequences.
I. Waudby-Smith, D. Arbour, R. Sinha, E. Kennedy, A. Ramdas Annals of Stat
- 63. 2024 Post-selection inference for e-value based confidence intervals.
Z. Xu, R. Wang, A. Ramdas Elec J Stat
Runner-up, Poster Competition, Multiple Comparisons Procedures
- 62. 2024 Interactive identification of individuals with positive treatment effect while controlling FDR.
B. Duan, L. Wasserman, A. Ramdas J Causal Inference
- 61. 2024 Multiple testing under negative dependence.
Z. Chi, A. Ramdas, R. Wang Bernoulli
- 60. 2024 Universal inference meets random projections: a scalable test for log-concavity.
R. Dunn, A. Gangrade, A. Ramdas, L. Wasserman J Comp Graph Stat
- 59. 2024 De Finetti's theorem and related results for infinite weighted exchangeable sequences.
R. Barber, E. Candes, A. Ramdas, R. Tibshirani Bernoulli
- 58. 2024 Anytime-valid off-policy inference in contextual bandits.
I. Waudby-Smith, L. Wu, A. Ramdas, N. Karampatziakis, P. Mineiro ACM/IMS J Data Sci

57. 2023 Data fission: splitting a single data point.
J. Leiner, B. Duan, L. Wasserman, A. Ramdas [J American Stat Assoc](#)
[Discussion paper](#)
[Runner-up, Poster Competition, Multiple Comparisons Procedures](#)
56. 2023 E-detectors: a nonparametric framework for online changepoint detection.
J. Shin, A. Rinaldo, A. Ramdas [New England J Stat & Data Sci](#)
55. 2023 A unified recipe for deriving (time-uniform) PAC-Bayes bounds.
B. Chugg, H. Wang, A. Ramdas [J ML Research](#)
54. 2023 A permutation-free kernel independence test.
S. Shekhar, I. Kim, A. Ramdas [J ML Research](#)
53. 2023 A composite generalization of Ville's martingale theorem using e-processes.
J. Ruf, M. Larsson, W. Koolen, A. Ramdas [Elec J Prob](#)
52. 2023 Online multiple hypothesis testing.
D. Robertson, J. Wason, A. Ramdas [Statistical Science](#)
51. 2023 Nonparametric two-sample testing by betting.
S. Shekhar, A. Ramdas [IEEE Trans Info Theory](#)
50. 2023 E-values as unnormalized weights in multiple testing.
N. Ignatiadis, R. Wang, A. Ramdas [Biometrika](#)
49. 2023 Comparing sequential forecasters.
YJ. Choe, A. Ramdas [Operations Research](#)
[Runner-up, Research Competition, Citadel Inaugural PhD Student Summit](#)
48. 2023 Game-theoretic statistics and safe anytime-valid inference.
A. Ramdas, P. Grunwald, V. Vovk, G. Shafer [Statistical Science](#)
47. 2023 Catoni-style confidence sequences for heavy-tailed mean estimation.
H. Wang, A. Ramdas [Stoch Proc & Appl](#)
46. 2023 Dimension-agnostic inference using cross U-statistics.
I. Kim, A. Ramdas [Bernoulli](#)
45. 2023 Conformal prediction beyond exchangeability.
R. Barber, E. Candes, A. Ramdas, R. Tibshirani [Annals of Stat](#)
44. 2023 Martingale methods for sequential estimation of convex functionals and divergences.
T. Manole, A. Ramdas [IEEE Trans Info Theory](#)
[Winner, Statistical Society of Canada, Student Paper Award](#)
43. 2023 Permutation tests using arbitrary permutation distributions.
A. Ramdas, R. Barber, E. Candes, R. Tibshirani [Sankhya A](#)
42. 2023 Estimating means of bounded random variables by betting.
I. Waudby-Smith, A. Ramdas [J Royal Stat Soc B](#)
[Discussion paper](#)
[Presentation award, Waterloo student conference](#)
41. 2022 On the power of conditional independence testing under model-X.
E. Katsevich, A. Ramdas [Elec J Stat](#)
40. 2022 Gaussian universal inference.
R. Dunn, S. Balakrishnan, A. Ramdas, L. Wasserman [Biometrika](#)
39. 2022 Brainprints: identifying individuals using magnetoencephalograms.
S. Wu, A. Ramdas, L. Wehbe [Nature Comm Bio](#)
38. 2022 Distribution-free prediction sets for two-layer hierarchical models.
R. Dunn, L. Wasserman, A. Ramdas [J American Stat Assoc](#)
37. 2022 Large-scale simultaneous inference under dependence.
J. Tian, X. Chen, E. Katsevich, J. Goeman, A. Ramdas [Scandinavian J Stat](#)
36. 2022 False discovery rate control using e-values.
R. Wang, A. Ramdas [J Royal Stat Soc B](#)
35. 2022 Sequential estimation of quantiles with applications to A/B-testing & bandits.
S. Howard, A. Ramdas [Bernoulli](#)
34. 2022 Nested conformal prediction and quantile out-of-bag ensemble methods.
C. Gupta, A. Kuchibhotla, A. Ramdas [Pattern Recognition](#)

33. 2021 Testing exchangeability: fork-convexity, supermartingales, and e-processes.
A. Ramdas, J. Ruf, M. Larsson, W. Koolen [Intl J Approx Reasoning](#)
32. 2021 Fast and powerful conditional randomization testing via distillation.
M.Liu, E. Katsevich, L. Janson, A. Ramdas [Biometrika](#)
31. 2021 On the bias, risk and consistency of sample means in multi-armed bandits.
J. Shin, A. Ramdas, A. Rinaldo [SIAM J Math of Data Science](#)
30. 2021 Nonparametric iterated-logarithm extensions of the sequential generalized LRT.
J. Shin, A. Ramdas, A. Rinaldo [IEEE J Selected Areas in Info Theory](#)
29. 2021 Path length bounds for gradient descent and flow.
C. Gupta, S. Balakrishnan, A. Ramdas [J ML Research](#)
28. 2021 Time-uniform, nonparametric, nonasymptotic confidence sequences.
S. Howard, A. Ramdas, J. Sekhon, J. McAuliffe [Annals of Stat](#)
27. 2021 Asynchronous online testing of multiple hypotheses.
T. Zrnic, A. Ramdas, M. Jordan [J ML Research](#)
26. 2021 Classification accuracy as a proxy for two-sample testing.
I. Kim*, A. Ramdas*, A. Singh, L. Wasserman [Annals of Stat](#)
[Winner, Stat Learning & Data Science Student Paper Award](#)
25. 2021 Online control of the familywise error rate.
J. Tian, A. Ramdas [Stat Meth in Medical Research](#)
24. 2021 Predictive inference with the jackknife+.
R. Barber, E. Candes, A. Ramdas, R. Tibshirani [Annals of Stat](#)
23. 2020 Interactive martingale tests for the global null.
B. Duan, A. Ramdas, S. Balakrishnan, L. Wasserman [Elec J Stat](#)
22. 2020 A general interactive framework for FDR control under structural constraints.
L. Lei, A. Ramdas, W. Fithian [Biometrika](#)
21. 2020 Simultaneous high-prob. bounds on the FDP in structured, regression & online settings.
E. Katsevich, A. Ramdas [Annals of Stat](#)
20. 2020 The limits of distribution-free conditional predictive inference.
R. Barber, E. Candes, A. Ramdas, R. Tibshirani [Information & Inference](#)
19. 2020 Time-uniform Chernoff bounds via nonnegative supermartingales.
S. Howard, A. Ramdas, J. Sekhon, J. McAuliffe [Prob Surveys](#)
18. 2020 Universal inference.
L. Wasserman*, A. Ramdas*, S. Balakrishnan* [PNAS](#)
17. 2020 Optimal rates and tradeoffs in multiple testing.
M. Rabinovich, A. Ramdas, M. Wainwright, M. Jordan [Stat Sinica](#)
16. 2019 Decoding from pooled data (I): sharp information-theoretic bounds.
A. El-Alaoui, A. Ramdas, F. Krzakala, L. Zdeborova, M. Jordan [SIAM J Math of Data Science](#)
15. 2019 Decoding from pooled data (II): phase transitions of message passing.
A. El-Alaoui, A. Ramdas, F. Krzakala, L. Zdeborova, M. Jordan [IEEE Trans Info Theory](#)
14. 2019 A unified treatment of multiple testing with prior knowledge using the p-filter.
A. Ramdas, R. Barber, M. Wainwright, M. Jordan [Annals of Stat](#)
13. 2019 Function-specific mixing times and concentration away from equilibrium.
M. Rabinovich, A. Ramdas, M. Wainwright, M. Jordan [Bayesian Analysis](#)
12. 2019 DAGGER: a sequential algorithm for FDR control on DAGs.
A. Ramdas, J. Chen, M. Wainwright, M. Jordan [Biometrika](#)
11. 2018 On kernel methods for covariates that are rankings.
H. Mania, A. Ramdas, M. Wainwright, M. Jordan, B. Recht [Elec J of Statistics](#)
10. 2018 The power of online thinning in reducing discrepancy.
R. Dwivedi, O. N. Feldheim, O. G. Gurevich, A. Ramdas [Prob Theory Related Fields](#)
9. 2017 Iterative methods for solving factorized linear systems.
A. Ma, D. Needell, A. Ramdas [SIAM J Matrix Analysis and App](#)
8. 2017 Rows vs. columns: randomized Kaczmarz or Gauss-Seidel for ridge regression.
A. Hefny*, D. Needell*, A. Ramdas* [SIAM J Scientific Comp.](#)

7. 2016	p-filter: multi-layer FDR control for grouped hypotheses. R. Barber*, A. Ramdas*	<u>J Royal Stat Soc B</u>
6. 2016	Wasserstein two-sample testing and related families of nonparametric tests. A. Ramdas, N. Garcia, M. Cuturi	<u>Entropy</u>
5. 2016	Fast & flexible ADMM algorithms for trend filtering. A. Ramdas, R. Tibshirani	<u>J Comp and Graphical Stat</u>
4. 2015	Convergence properties of the rand. extended Gauss-Seidel & Kaczmarz methods. A. Ma*, D. Needell*, A. Ramdas*	<u>SIAM J Matrix Analysis and App.</u>
3. 2015	Towards a deeper geometric, analytic and algorithmic understanding of margins. A. Ramdas, J. Peña	<u>Opt Meth and Software</u>
2. 2015	Regularized brain reading with shrinkage and smoothing. L. Wehbe, A. Ramdas, R. Steerts, C. Shalizi	<u>Annals of Applied Stat</u>
1. 2014	Simultaneously uncovering patterns of brain regions involved in story reading. L. Wehbe, B. Murphy, P. Talukdar, A. Fyshe, A. Ramdas, T. Mitchell	<u>PLoS ONE</u>

Published, full-length, peer-reviewed conference papers

Most AI/ML conferences have blind peer-reviewing, low acceptance rates (20-30%), and official proceedings. Oral talks often indicate top few percent of all papers. The following list excludes short workshop papers, which usually have high acceptance rates, and often no proceedings. There is no paper mentioned below that was also extended to a journal paper listed above.

64. 2024	Bias detection via signaling. T. Lin, I. Shapira, A. Ramdas, Y. Chen, A. Procaccia	<u>NeurIPS</u>
63. 2024	Total variation floodgate for variable importance inference in classification. W. Wang, L. Janson, L. Lei, A. Ramdas	<u>ICML</u>
62. 2024	Reducing sequential change detection to sequential estimation. S. Shekhar, A. Ramdas	<u>ICML</u>
61. 2024	Differentially private conditional independence testing. I. Kalemaj, S. Kasivishwanathan, A. Ramdas	<u>AISTATS</u>
60. 2024	Testing exchangeability by pairwise betting. A. Saha, A. Ramdas	<u>long oral AISTATS</u>
59. 2024	Online multiple testing with e-values. Z. Xu, A. Ramdas	<u>AISTATS</u>
58. 2024	Graph fission and cross-validation. J. Leiner, A. Ramdas	<u>AISTATS</u>
57. 2024	Deep anytime-valid hypothesis testing. T. Pandeva, P. Forré, A. Ramdas, S. Shekhar	<u>AISTATS</u>
56. 2024	Semiparametric efficient inference for adaptive experiments. T. Cook, A. Mishler, A. Ramdas	<u>CLEAR</u>
55. 2023	An efficient doubly-robust test for the kernel treatment effect. D. Taboada, E. Kennedy, A. Ramdas	<u>NeurIPS</u>
54. 2023	Counterfactually comparing abstaining classifiers. YJ. Choe, A. Gangrade, A. Ramdas	<u>NeurIPS</u>
53. 2023	Sequential predictive two-sample and independence testing. A. Podkopaev, A. Ramdas	<u>NeurIPS</u>
52. 2023	Adaptive privacy composition for accuracy-first mechanisms. R. Rogers, S. Wu, G. Samorodnitsky, A. Ramdas	<u>NeurIPS</u>
51. 2023	Auditing fairness by betting. B. Chugg, S Cortes-Gomez, B. Wilder, A. Ramdas	<u>spotlight NeurIPS</u>
50. 2023	On the sublinear regret of GP-UCB. J. Whitehouse, S. Wu, A. Ramdas	<u>NeurIPS</u>
49. 2023	Risk-limiting financial audits via weighted sampling without replacement. S. Shekhar, Z. Xu, Z. Lipton, P. Liang, A. Ramdas	<u>UAI</u>
48. 2023	Fully adaptive composition in differential privacy. J. Whitehouse, A. Ramdas, S. Wu, R. Rogers	<u>ICML</u>

47. 2023 Nonparametric extensions of randomized response for private confidence sets.
I. Waudby-Smith, S. Wu, A. Ramdas [oral ICML](#)
46. 2023 Sequential change detection via backward confidence sequences.
S. Shekhar, A. Ramdas [ICML](#)
45. 2023 Online Platt scaling with calibrating.
C. Gupta, A. Ramdas [ICML](#)
44. 2023 Sequential kernelized independence testing.
A. Podkopaev, P. Bloebaum, S. Kasivishwanathan, A. Ramdas [ICML](#)
43. 2023 Anytime-valid confidence sequences in an enterprise A/B testing platform.
A. Maharaj, R. Sinha, D. Arbour, I. Waudby-Smith, S. Liu, M. Sinha, R. Addanki, A. Ramdas, M. Garg, V. Swaminathan [The Web Conf \(WWW\)](#)
42. 2023 Huber-robust confidence sequences.
H. Wang, A. Ramdas [long oral AISTATS](#)
41. 2022 Brownian noise reduction: maximizing privacy subject to accuracy constraints.
J. Whitehouse, A. Ramdas, S. Wu, R. Rogers [NeurIPS](#)
40. 2022 A permutation-free kernel two sample test.
S. Shekhar, I. Kim, A. Ramdas [long oral NeurIPS](#)
39. 2022 Faster online calibration without randomization: interval forecasts and power of two choices.
C. Gupta, A. Ramdas [COLT](#)
38. 2022 Top-label calibration and multiclass-to-binary reductions.
C. Gupta, A. Ramdas [ICLR](#)
37. 2022 Tracking the risk of a deployed model and detecting harmful distribution shifts.
A. Podkopaev, A. Ramdas [ICLR](#)
36. 2022 Interactive rank testing by betting.
B. Duan, L. Wasserman, A. Ramdas [long oral CLEAR](#)
35. 2021 A unified framework for bandit multiple testing.
N. Xu, R. Wang, A. Ramdas [NeurIPS](#)
34. 2021 RiLACS: risk limiting audits via confidence sequences.
I. Waudby-Smith, P. Stark, A. Ramdas [EVoteID](#)
[Best Paper Award](#)
33. 2021 Distribution-free uncertainty quantification for classification under label shift.
A. Podkopaev, A. Ramdas [long oral UAI](#)
32. 2021 Best arm identification in additive transfer bandits.
O. Neopane, A. Singh, A. Ramdas [Asilomar](#)
[Best Student Paper Award](#)
31. 2021 Distribution-free calibration guarantees for uniform-mass binning without sample splitting.
C. Gupta, A. Ramdas [ICML](#)
30. 2021 Off-policy confidence sequences.
N. Karampatziakis, P. Mineiro, A. Ramdas [ICML](#)
29. 2021 Dynamic algorithms for online multiple testing.
N. Xu, A. Ramdas [Math and Sci ML](#)
28. 2021 Uncertainty quantification using martingales for misspecified Gaussian processes.
W. Neiswanger, A. Ramdas [ALT](#)
27. 2020 Confidence sequences for sampling without replacement.
I. Waudby-Smith, A. Ramdas [spotlight NeurIPS](#)
26. 2020 Distribution-free binary classification: prediction sets, confidence intervals and calibration.
C. Gupta, A. Podkopaev, A. Ramdas [spotlight NeurIPS](#)
25. 2020 Familywise error rate control by interactive unmasking.
B. Duan, A. Ramdas, L. Wasserman [ICML](#)
24. 2020 Conditional versus marginal bias in multi-armed bandits.
J. Shin, A. Ramdas, A. Rinaldo [ICML](#)
23. 2020 Online control of the false coverage rate and false sign rate.
A. Weinstein*, A. Ramdas* [ICML](#)
22. 2020 The power of batching in multiple hypothesis testing.
T. Zrnic, D. Jiang, A. Ramdas, M. Jordan [AISTATS](#)

21. 2020 Analyzing student strategies in blended courses using clickstream data.
N. Akpınar, A. Ramdas, U. Acar [long oral](#) Edu. Data Mining
20. 2019 Conformal prediction under covariate shift.
R. Tibshirani, R. Barber, E. Candes, A. Ramdas NeurIPS
19. 2019 A higher order Kolmogorov-Smirnov test.
V. Sadhanala, Y. Wang, A. Ramdas, R. Tibshirani [long oral](#) AISTATS
18. 2019 Are sample means in multi-armed bandits positively or negatively biased?.
J. Shin, A. Ramdas, A. Rinaldo [spotlight](#) NeurIPS
17. 2019 ADDIS: an adaptive discarding alg. for online FDR control with conservative nulls.
J. Tian, A. Ramdas NeurIPS
16. 2018 SAFFRON: an adaptive algorithm for online FDR control.
A. Ramdas, T. Zrnic, M. Wainwright, M. Jordan [long oral](#) ICML
15. 2017 Online control of the false discovery rate with decaying memory.
A. Ramdas, F. Yang, M. Wainwright, M. Jordan [long oral](#) NeurIPS
14. 2017 MAB-FDR: Multi (A)rmed/(B)andit testing with online FDR control.
F. Yang, A. Ramdas, K. Jamieson, M. Wainwright [spotlight](#) NeurIPS
13. 2017 QuTE: decentralized multiple testing on sensor networks with FDR control.
A. Ramdas, J. Chen, M. Wainwright, M. Jordan IEEE CDC
12. 2017 Generative models and model criticism via optimized Maximum Mean Discrepancy.
D. Sutherland, H. Tung, H. Strathmann, S. De, A. Ramdas, A. Smola, A. Gretton ICLR
11. 2016 Sequential nonparametric testing using the law of the iterated logarithm.
A. Balsubramani*, A. Ramdas* UAI
10. 2016 Minimax lower bounds for linear independence testing.
D. Isenberg*, A. Ramdas*, A. Singh, L. Wasserman IEEE ISIT
9. 2016 Asymptotic behavior of ℓ_q -based Laplacian regularization in semi-supervised learning.
A. El-Alaoui, X. Cheng, A. Ramdas, M. Wainwright, M. Jordan COLT
8. 2015 Fast two-sample testing with analytic representations of probability measures.
K. Chwiałkowski, A. Ramdas, D. Sejdinovic, A. Gretton NeurIPS
7. 2015 High-dimensional power of linear-time two-sample tests for mean-shift alternatives.
S. Reddi*, A. Ramdas*, B. Poczos, A. Singh, L. Wasserman AISTATS
6. 2015 On the decreasing power of kernel- & distance-based hyp. tests in high dimensions.
A. Ramdas*, S. Reddi*, B. Poczos, A. Singh, L. Wasserman AAAI
5. 2015 Nonparametric independence testing for small sample sizes.
A. Ramdas*, L. Wehbe* [long oral](#) IJCAI
4. 2014 Margins, kernels and non-linear smoothed perceptrons.
A. Ramdas, J. Peña [long oral](#) ICML
3. 2014 An analysis of active learning with uniform feature noise.
A. Ramdas, B. Poczos, A. Singh, L. Wasserman [long oral](#) AISTATS
2. 2013 Optimal rates for stochastic convex optimization under Tsybakov noise condition.
A. Ramdas, A. Singh [long oral](#) ICML
1. 2013 Algorithmic connections between active learning & stochastic convex optimization.
A. Ramdas, A. Singh [long oral](#) ALT

Under Review

- (arXiv) Hypothesis testing with e-values.
A. Ramdas, R. Wang submitted, F&T Stat
- (arXiv) A sequential test for log-concavity.
A. Gangrade, A. Rinaldo, A. Ramdas revision, Sequential Analysis
- (arXiv) On the near-optimality of betting confidence sets for bounded means.
S. Shekhar, A. Ramdas revision, Information & Inference
- (arXiv) Sequential Monte-Carlo testing by betting.
L. Fischer, A. Ramdas revision, JRSSB
- (arXiv) The numeraire e-variable and reverse information projection.
M. Larsson, A. Ramdas, J. Ruf revised, AoS

- (arXiv) Time-uniform self-normalized concentration for vector-valued processes.
J. Whitehouse, S. Wu, A. Ramdas submitted, AoAP
- (arXiv) Conformal online model aggregation.
M. Gasparin, A. Ramdas submitted, Machine Learning
- (arXiv) Merging uncertainty sets via majority vote.
M. Gasparin, A. Ramdas submitted, JASA
- (arXiv) Anytime-valid t-tests and confidence sequences for Gaussian means with unknown variance.
H. Wang, A. Ramdas revised, Sequential Analysis
- (arXiv) Combining evidence across filtrations using adjusters.
YJ. Choe, A. Ramdas revision, JRSSB
- (arXiv) Combining exchangeable p-values.
M. Gasparin, R. Wang, A. Ramdas revised, PNAS
- (arXiv) β -calibration: post-hoc calibration of language model confidence scores for generative QA.
P. Manggala, A. Mastakouri, E. Kirschbaum, S. Kasivishwanathan, A. Ramdas submitted, ICLR
- (arXiv) Sequential Kernelized Stein Discrepancy.
D. Taboada, A. Ramdas submitted, AISTATS
- (arXiv) Robust likelihood ratio tests for composite nulls and alternatives.
A. Saha, A. Ramdas submitted, IEEE TIT
- (arXiv) Matrix concentration: order versus anti-order.
R. Malekian, A. Ramdas submitted, Lin Alg App
- (arXiv) Distribution-uniform strong laws of large numbers.
I. Waudby-Smith, M. Larsson, A. Ramdas submitted, EJP
Winner, Statistical Society of Canada, Student Paper Award
- (arXiv) Time-uniform confidence spheres for means of random vectors.
B. Chugg, H. Wang, A. Ramdas submitted, ALT
- (arXiv) Conformalized interactive imitation learning: handling expert shift & intermittent feedback.
M. Zhao, H. Admoni, R. Simmons, A. Ramdas, A. Bajcsy submitted, ICLR
- (pre) Logarithmic Neyman regret for adaptive estimation of the average treatment effect.
O. Neopane, A. Singh, A. Ramdas submitted, AISTATS
- (arXiv) Anytime-valid inference for double/debiased machine learning of causal parameters.
A. Dalal, P. Blöbaum, S. Kasivishwanathan, A. Ramdas submitted, JASA
- (arXiv) Empirical Bernstein in smooth Banach spaces.
D. Taboada, A. Ramdas submitted, AoAP

Working papers

- (pre) Inference for bounded means: relating empirical likelihood, KL-inf and betting .
S. Agrawal, A. Ramdas
- (arXiv) Compound e-values and Empirical Bayes.
N. Ignatiadis, R. Wang, A. Ramdas
- (arXiv) Positive semidefinite supermartingales and randomized matrix concentration inequalities.
H. Wang, A. Ramdas
- (arXiv) More powerful multiple testing under dependence via randomization.
Z. Xu, A. Ramdas
- (psyarXiv) Practical maximally flexible sampling designs for experiments based on e-values.
A. Ly, U. Boehm, P. Grünwald, A. Ramdas, D. van Ravenzwaaij
- (arXiv) Multiple testing with anytime-valid Monte-Carlo p-values.
L. Fischer, A. Ramdas
- (arXiv) Improving the (approximate) sequential probability ratio test by avoiding overshoot.
L. Fischer, A. Ramdas
- (arXiv) An online generalization of the (e-)Benjamini-Hochberg procedure.
L. Fischer, Z. Xu, A. Ramdas
- (arXiv) Online closed testing with e-values.
L. Fischer, A. Ramdas

- (arXiv) Scalable causal structure learning via amortized conditional independence testing.
J. Leiner, B. Manzo, A. Ramdas, W. Tansey
- (arXiv) Admissible anytime-valid sequential inference must rely on nonnegative martingales.
A. Ramdas, J. Ruf, M. Larsson, W. Koolen
- (pre) The lady keeps tasting coffee.
A. Ramdas, L. Wehbe
- (arXiv) Testing by betting while borrowing and bargaining.
H. Wang, A. Ramdas
- (pre) Conditional independence testing for high-dimensional nonstationary nonlinear time series.
M. Wieck-Sosa, M. Haddad, A. Ramdas
- (arXiv) Distribution-uniform anytime-valid inference.
I. Waudby-Smith, A. Ramdas

Miscellaneous articles

- 2024 Discussion of "Poisson-focus: An efficient online method for ... gamma ray burst detection".
A. Saha, A. Ramdas J Amer Stat Assoc
- 2024 Discussion of "Safe Testing".
M. Larsson, A. Ramdas, J. Ruf J Royal Stat Soc B
- 2024 Rejoinder for the discussion of "Estimating means of bounded random variables by betting".
I. Waudby-Smith, A. Ramdas J Royal Stat Soc B
- 2023 Discussion of "A note on universal inference".
L. Wasserman, A. Ramdas, S. Balakrishnan STAT
- 2021 Discussion of "Testing by betting".
A. Ramdas J Royal Stat Soc A
- 2019 Discussion of "Covariate-assisted ranking and screening for two-sample inference".
A. Ramdas J Royal Stat Soc B
- 2015 Adaptivity & comp.-Stat tradeoffs for high-dimensional two-sample testing.
A. Ramdas, S. Reddi, B. Poczos, A. Singh, L. Wasserman technical report
- 2015 Computational and Statistical Advances in Testing and Learning.
A. Ramdas CMU PhD Thesis
[Umesh K. Gavaskar Memorial Thesis Award](#)
- 2011 Algorithms for graph similarity and subgraph matching.
D. Koutra, A. Parikh, A. Ramdas, J. Xiang technical report

Presentations

Slides and videos to several talks and tutorials are linked from my website. Keynote talks are mentioned under Awards and Honors.

Tutorials, Summer Schools, etc.

- 2024 Game-theoretic statistics: e-values, betting and martingales (15hrs) (Columbia Univ., USA)
- 2024 Game-theoretic statistics: e-values, betting and martingales (6hrs) (GeorgiaTech, USA)
- 2023 Game-theoretic statistics: e-values, betting and martingales (2hrs) (Lunteren, Netherlands)
- 2022 Anytime-valid inference and game-theoretic statistics (5hrs) (CUSO, Switzerland)
- 2022 Anytime-valid inference and game-theoretic statistics (3hrs) (SAVI, Eindhoven)
- 2022 Distribution-free predictive inference (2.5hrs) (NCC, Bombay)
- 2022 Conformal prediction (2hrs) (Amazon, Berlin)
- 2021 Distribution-free calibration (1.5hrs) (MLCS, Toulouse)
- 2020 Conformal prediction (2hrs) (Learning Theory W'shop, TIFR)
- 2019 Large-scale sequential experimentation (4hrs) (KDD, Alaska)

University Seminars

- 2024 Game-theoretic statistics and safe, anytime-valid inference (Stanford, Stat)
- Merging uncertainty sets via majority vote (CMU, AI-SDM)
- Game-theoretic statistics and safe, anytime-valid inference (Berkeley, Stat)
- The numeraire e-variable and reverse information projection (Yale, Data Science)

	Game-theoretic statistics and safe, anytime-valid inference	(UF, Stat)
	A martingale theory of evidence	(WashU, Stat)
	Game-theoretic statistics and safe, anytime-valid inference	(JHU, Stat)
	Game-theoretic statistics and safe, anytime-valid inference	(UTAustin, Stat)
2023	Game-theoretic statistics and safe, anytime-valid inference	(EPFL, Stat)
	Game-theoretic statistics and safe, anytime-valid inference	(MIT, EECS)
	Randomized improvements to Markov's inequality	(PennState, Stat)
	Estimating means of bounded random variables by betting	(NTU Athens, CS)
	Conformal prediction under distribution shift	(UAmsterdam, CS)
	Distribution-free inference under distribution shift	(McWilliams, Cosmology)
	Randomized improvements to Markov's inequality	(Cambridge, Stat)
2022	Conformal prediction beyond exchangeability	(ETH Zurich, CS)
	Estimating means of bounded random variables by betting	(Rutgers, Stat)
	Game-theoretic statistics	(Geneva, Stat)
	Conformal prediction beyond exchangeability	(Ecole Poly, Stat)
2021	Universal inference, e-values and multiple testing	(Mich State U, Stat)
	Universal inference, e-values and multiple testing	(Duke, BioStat)
	Comparing sequential forecasters	(USC, Marshall)
	Comparing sequential forecasters	(UC Boulder, CS)
	Universal inference, e-values and multiple testing	(UC Riverside, Stat)
	Sequential, interactive, dimension-agnostic inference	(CERN, Stat/Phy)
	Estimating means of bounded random variables by betting	(ETH, Stat)
	Estimating means of bounded random variables by betting	(Iowa, Stat)
	Distribution-free uncertainty quantification: conformal and calibration	(MBZUAI, CS)
	Distribution-free multi-class calibration	(UFSCAR, Stat)
2020	Dimension-agnostic inference	(Ecole Poly., Stat/Prob)
	Distribution-free inference: conformal prediction and calibration	(UToulouse, Stat/ML)
	The lady keeps tasting coffee	(UGA, Stat)
	Betting scores, e-values and martingales	(Rutgers, Prob)
	Online multiple testing	(UNC, Biostat)
	Election auditing via confidence sequences for sampling w/o replacement	(UWaterloo, Stat)
	Election auditing via confidence sequences for sampling w/o replacement	(CMU, Theory)
	Assumption-free prediction intervals for black-box regression algorithms	(Princeton, IAS)
2019	Uniform, nonasymptotic, nonparametric confidence sequences	(Columbia, Prob)
	Bias, risk and consistency of sample means in multi-armed bandits	(Rice, ECE)
	Uniform, nonasymptotic, nonparametric confidence sequences	(McGill, Stat)
	Exponential line-crossing inequalities	(MIT, IDSS)
	Bias, risk and consistency of sample means in multi-armed bandits	(Berkeley, EE)
	Quantiles for bandits and RL	(Mila, CS)
	Doubly-sequential experimentation	(IU, Psych)
2018	Sequential estimation of coin bias and nonparametric generalizations	(Oxford, CSML)
	A new framework for large-scale sequential A/B testing	(IIT Delhi, CS)
	Interactive algorithms for multiple hypothesis testing	(USC, Marshall)
	Exponential line-crossing inequalities	(USC, Math)
	Uniform, nonasymptotic, nonparametric confidence sequences	(Bocconi Milan, DS)
	Interactive algorithms for multiple hypothesis testing	(UCSD, Math)
	Interactive algorithms for multiple hypothesis testing	(UC Davis, Stat)
	Interactive algorithms for multiple hypothesis testing	(UIUC, Stat)
	Interactive algorithms for multiple hypothesis testing	(GaTech, ISyE)
	From stopping times to spotting times in multiple testing	(Stanford, Stat)
	Towards "simultaneous selective inference"	(Berkeley, Stat)
	From stopping times to spotting times in multiple testing	(Princeton, ORFE)

	From stopping times to spotting times in multiple testing	(Cambridge, Stat)
	Towards “simultaneous selective inference”	(UMich., Stat)
	Interactive algorithms for multiple hypothesis testing	(CMU, Stat)
	Towards “simultaneous selective inference”	(Wharton, Stat)
	Towards “simultaneous selective inference”	(EPFL, Math.)
	A new framework for large-scale sequential A/B testing	(EPFL, CS)
	A new framework for large-scale sequential A/B testing	(ETH Zurich, CS)
	Interactive algorithms for multiple hypothesis testing	(Caltech, CMS)
	Interactive algorithms for multiple hypothesis testing	(Duke, Stat)
	A new framework for large-scale sequential A/B testing	(UCL, Gatsby)
	Interactive algorithms for multiple hypothesis testing	(Columbia, Stat)
	Interactive algorithms for multiple hypothesis testing	(UChicago, Stat+Booth)
	Interactive algorithms for multiple hypothesis testing	(UWash., Stat)
	Interactive algorithms for multiple hypothesis testing	(Harvard, Stat)
	Interactive algorithms for multiple hypothesis testing	(Yale, Stat)
	Interactive algorithms for multiple hypothesis testing	(Cornell, Stat)
	A new framework for large-scale sequential A/B testing	(UIUC, CS)
	A new framework for large-scale sequential A/B testing	(Columbia, CS)
2017	DAGGER: A sequential algorithm for FDR control on DAGs	(Stanford, BioStat)
	DAGGER: A sequential algorithm for FDR control on DAGs	(UCB, BioStat seminar)
	STAR: Interactive multiple testing for structured FDR control	(Temple Univ., Stat)
	STAR: Interactive multiple testing for structured FDR control	(UTSW, Biomed.)
	Is reproducibility a problem in the tech industry?	(UCB, BAIR seminar)
	Multi (A)rmad/(B)andit testing with online FDR control	(UTSW, Biomed.)
	Multi (A)rmad/(B)andit testing with online FDR control	(CMU, ML/AI)
	Multi (A)rmad/(B)andit testing with online FDR control	(Stanford, MS&E)
	Multi (A)rmad/(B)andit testing with online FDR control	(UT Austin, ECE)
	QuTE: Decentralized FDR control on sensor networks	(UCB, BLISS seminar)
2016	False Discovery Rate: a tutorial and new directions	(IIT Bombay, EE)
	p-Filter: FDR control for grouped hypotheses	(Wharton, Stat)
	p-Filter: FDR control for grouped hypotheses	(Stanford, Stat)
	p-Filter: FDR control for grouped hypotheses	(UC Davis, Stat)
	Asymptotics of Laplacian regularization in semi-supervised learning	(CMU, ML)
2015	Adaptivity in high-dimensional two sample testing	(UC Berkeley, CS)
2014	Adaptivity in high-dimensional two sample testing	(Kyoto University, Stat)
	Adaptivity in high-dimensional two sample testing	(ISM Tachikawa, Stat)
	Fast & flexible algorithms for trend filtering	(Gatsby, Neuro.)
2013	Connecting active learning and stochastic optimization	(CMI Chennai, Math.)
	Connecting active learning and stochastic optimization	(IIT Madras, CS)
Industry Research Labs		
2024	Interactive identification of individuals with positive treatment effect	(Novartis)
	Merging uncertainty sets via majority vote	(Amazon, Berlin)
	A martingale theory of evidence	(NIAID, DC)
2023	Sequential change detection	(Amazon, Berlin)
2022	Conformal prediction	(Bain, NY)
	Auditing elections: why and how?	(Amazon, Berlin)
	Conditional independence testing	(Amazon, Bay Area)
	Fully adaptive composition in differential privacy	(Google, NY)
	Doubly-sequential experimentation	(Google, Mountain View)
	Asymptotic confidence sequences	(Adobe, Bay Area)
2021	Auditing elections: why and how?	(MSR, NY)

	Doubly sequential experimentation	(Vinted, Lithuania)
	Universal inference, e-values and multiple testing	(Novartis)
2020	Interactive, sequential experimentation	(Berry Consultants, NY)
2019	A framework for asynchronous large-scale sequential testing	(Two Sigma, NY)
	A framework for asynchronous large-scale sequential testing	(MSR, Montreal)
	Sequential estimation of quantiles for A/B testing and bandits	(MSR, Redmond)
	Are bandit sample means positively or negatively biased?	(Google, Pittsburgh)
	A gentle introduction to conformal prediction	(MSR, Montreal)
2018	A new framework for large-scale sequential A/B testing	(MSR, New England)
2017	Is reproducibility a problem in the tech industry?	(Uber Research, SF)
	Is reproducibility a problem in the tech industry?	(AirBnB Research, SF)
2016	Sequential and multiple testing in modern ML	(Groupon Research, Palo Alto)
	p-Filter: FDR control for grouped hypotheses	(Lawrence National Labs, Livermore)
	Multiple testing issues in industry	(AmpLab industry retreat)
2015	Sequential nonparametric testing	(Alibaba Research, Seattle)
	Sequential nonparametric testing	(Google Research, Pittsburgh)
2014	Fast & flexible algorithms for trend filtering	(MSR, Cambridge)
2013	Active learning & stochastic optimization	(IBM Research, Bangalore)
2012	Connecting statistical & logical inference	(MSR, Cambridge)

Conference and Workshop Talks

2025	E-processes and e-detectors	(Vienna Cong. Math. Fin. keynote)
	Sequential observational causal inference	(Symp on AI in Pharma Medicine plenary)
2024	Conformal online model aggregation	(AISTATS keynote)
	Data fission: splitting a single sample	(JSM JASA discussion paper talk)
	Discussion: conditional permutation test	(JRSS webinar)
	Three new directions for game-theoretic statistics	(Oberwolfach)
	E-processes and e-detectors	(Allerton)
	E is the new P	(NAS Kavli)
2023	A nonparametric extension of Warner's randomized response	(JSM award talk)
	Estimating means of bounded random variables by betting	(JRSS discussion paper talk)
	Advances in multiple testing: negative dependence and randomization	(ISSI)
	E-detectors and backward confidence sequences	(Warwick)
	Distribution-free uncertainty quantification under distribution shift	(UAI)
	A unified recipe for deriving (time-uniform) PAC-Bayes bounds	(ICML)
	Randomized improvements to Markov's inequality	(ASA)
2022	Online nonparametric changepoint detection with e-detectors	(CISS)
	E-values as unnormalized weights in multiple testing	(ISSI)
	Interactive rank testing by betting	(CLEAR)
	Safe anytime-valid inference in bandit data analysis	(OneWorld)
	Universal inference	(BFF)
2021	Interactive and online multiple testing	(JRSS Webinar)
	A semiparametric approach to variable importance	(JSM)
	Distribution-free uncertainty quantification	(IFDS Madison)
	Martingales, e-values and betting	(IMS World Stat Congress award talk)
	Estimating means of bounded random variables by betting	(ICON-STARF)
	Online multiple testing	(MCP)
	Interactive multiple testing	(MRC Cambridge)
2020	Universal inference using the split likelihood ratio test	(ITA)
	Confidence sequences and nonparametric supermartingales	(ISSI)
	UQ using martingales for misspecified Gaussian processes	(ICML Active Learning Wshop)
	Universal inference using the split likelihood ratio test	(Marseille Luminy)

	Betting scores, e-values and martingales	(JRSS discussion)
2019	Interactive FDR control with a human-in-the-loop	(ISI-YSM)
	Theoretical guarantees for doubly sequential experimentation	(UCSD Data Science)
	A unified framework for martingale concentration inequalities	(ITA)
	Online control of the false coverage rate	(WHOA-PSI4)
	The state-of-the-art in online multiple testing	(MCP)
	Simultaneous inference in sequential analysis	(ICSA)
	A tutorial on conformal prediction	(IPAM)
	Are sample means in multi-armed bandits positively or negatively biased?	(Asilomar)
2018	Towards “simultaneous selective inference”	(WHOA-PSI3)
	Towards “simultaneous selective inference”	(CMStat)
	SAFFRON: an adaptive algorithm for online FDR control	(ICML)
	Towards “simultaneous selective inference”	(CiMi)
	Uniform nonasymptotic confidence sequences for sequential estimation	(INI)
2017	On kernel methods for covariates that are rankings	(CNA)
	Online FDR control with decaying memory	(NeurIPS)
	QuTE: decentralized multiple testing on sensor networks with FDR control	(CDC)
	A unified treatment of multiple testing with prior knowledge	(MCP)
	Optimal rates and tradeoffs in multiple testing	(MCP)
	Optimal rates and tradeoffs in multiple testing	(ICSA)
	Sequential nonparametric testing using the law of the iterated logarithm	(ITA)
	The power of online thinning in reducing discrepancy	(MCM)
	The power of online thinning in reducing discrepancy	(IISA)
	STAR: Interactive multiple testing for structured FDR control	(WHOA-PSI2)
2016	A unified framework for multiple testing with prior knowledge	(NeurIPS WADAPT)
	Sequential nonparametric testing using the law of the iterated logarithm	(Lorentz)
	Function-specific mixing times and concentration away from equilibrium	(MCQMC)
	Minimax bounds for linear independence testing	(ISIT)
	Function-specific mixing times and concentration away from equilibrium	(ISBA)
	Beyond worst-case mixing times for markov chains	(ITA)
2015	Nonparametric independence testing for small sample sizes	(IJCAI)
	Adaptivity in high-dimensional two-sample testing	(JSM)
	Sequential nonparametric testing using the law of the iterated logarithm	(IWSM)
2014	Margins, kernels and nonlinear smoothed perceptrons	(ICML)
	Active learning with uniform feature noise	(AISTATS)
2013	Connecting convex optimization and active learning	(NeurIPS OPT)
	Algorithmic connections between convex optimization and active learning	(ALT)
	Optimal convex optimization under Tsybakov noise condition	(ICML)

Teaching

Courses taught

Designed and offered 8 new semester-long courses. Syllabi, lecture notes, etc, are all linked from my website.

2024 (F)	Corporate Capstone (UG),	<i>Co-Instructor + G. Mena.</i>
2024 (S)	Game-theoretic probability, statistics and learning (PhD),	<i>Instructor.</i>
2023 (S)	The ABCDE of Statistical Methods in Machine Learning (PhD),	<i>Instructor.</i>
2022 (F)	Voting (UG),	<i>Co-instructor + L. Tetrault (Hist.).</i>
2022 (S)	The ABCDE of Statistical Methods in Machine Learning (PhD),	<i>Instructor.</i>
2021 (F)	Historical advances in machine learning (PhD),	<i>Instructor.</i>
2021 (S)	Game-theoretic statistics (PhD),	<i>Co-instructor + G. Shafer (Rutgers), R. Wang (Waterloo).</i>
2021 (S)	The ABCDE of Statistical Methods in Machine Learning (PhD),	<i>Instructor.</i>

- 2020 (F) Voting (UG), *Co-instructor + T. Seidenfeld (Phil.), L. Tetrault (Hist.)*.
 2020 (S) The ABCDE of Statistical Methods in Machine Learning (PhD), *Instructor*.
 2019 (F) Statistical methods for reproducibility (PhD), *Instructor*.
 2019 (S) Introduction to Machine Learning (PhD), *Co-instructor + L. Wehbe (ML)*.
 2018 (F) Martingales and sequential analysis (PhD), *Instructor*.

Teacher Training

- 2013-15 Completed "Future Faculty" training program by CMU's Eberly Center (transcript available).
 2014-20 Training Seminars: Course & syllabus design, Promoting peer learning, Planning & delivering effective lectures, Leveraging diversity & promoting equity, Conducting productive discussions, Engaging students in active learning, Good assessment practices, Bias-busters

Grants (or awards/gifts)

- 2024-25 PricewaterhouseCoopers Research Grant. "Extensions and Applications of Efficient AI-Enhanced Auditing". Multi-PI (+Pierre Liang, Zachary Lipton), \$442,250 over 1 year (awarded 04/29/2024).
 2024-26 Sloan Fellowship in Mathematics (FG-2024-22012). "Foundations of Game-Theoretic Statistics". Sole PI, \$75,000 over 2 years (awarded 05/03/2024).
 2023-28 NSF IIS-2229881. "AI Institute for Societal Decision Making". Multi-PI (+Aarti Singh, Ariel Procaccia, Sham Kakade, etc.), \$20,000,000 over 5 years (awarded 04/25/2023).
 2023-26 NSF DMS-2310718. "Game theoretic statistics and safe anytime-valid inference". Sole PI. \$160,000 over 3 years (recommended 05/17/2023).
 2023-24 Dietrich Seed Grant. "Forecasting military coups" (+John Chin), \$25,000.
 2022-27 NSF CSSI 2209819. "Frameworks for Intelligent Adaptive Experimentation: Enhancing and Tailoring Digital Education". Multi-PI (+Joseph Williams, John Stamper, Norman Bier, Jeff Carver, Steve Ritter), \$3,000,000 over 5 years (awarded 08/01/2022).
 2022 Google [Research Scholar Award](#). "Structured uncertainty quantification for machine learning" Sole PI, \$60,000.
 2022 Citadel Gift (+ YJ Choe's Citadel PhD summit award). Sole PI, \$10,000.
 2021 Bloomberg Gift (+ Chirag Gupta's Bloomberg PhD student fellowship). Sole PI, \$15,000.
 2021-22 PricewaterhouseCoopers Research Grant. "Efficient AI-Enhanced Financial Statement Auditing with Statistical Guarantees". Multi-PI (+Pierre Liang, Zachary Lipton), \$407,500 over 1 year (awarded 10/01/2021).
 2021-23 Army Research Lab Grant W911NF-17-2-0196 (IoBT CRA). "Enabling the Safe and Responsible Use of RL". Multi-PI (+Philip Thomas, Emma Brunskill, Nan Jiang), \$760,000 over 18 months (awarded 02/01/2021).
 2021-24 NSF DMS (CDS&E-MSS) 2053804. "Statistical Procedures and Performance Measures for Simulator-Based Frequentist Inference". Multi-PI (+Ann Lee, Mikael Kuusela), \$425,000 over 3 years (awarded 07/01/2021).
 2020-25 NSF DMS 1945266 ([CAREER award](#)). "Online multiple hypothesis testing: a comprehensive treatment". Sole PI, \$400,000 over 5 years (awarded 11/15/2019).
 2020-22 Block Center Grant. "Developing and deploying risk-limiting election audits with continuous monitoring". Sole PI, \$40,000 over two years.
 2019 Adobe [Faculty Research Award](#). "Quantile-based A/B testing and multi-armed bandits". Sole PI, \$80,000.
 2019-21 Berkman Faculty Fellowship. Sole PI, \$5,000 over two years.
 2019-22 NSF DMS 1916320. "Nonparametric confidence sequences and their applications". Sole PI, \$160,000 over 3 years (awarded 7/30/2019).

Mentorship

- 2020 Completed active listening training session by CMU's Counseling and Psychological Services.

Postdoctoral researchers

- 2024-26 Margaux Zaffran (StatDS, joint with R. Tibshirani).

- 2024 Shubhada Agrawal (StatDS).
Next position: Assistant Professor in CS, IISc
- 2021-24 Shubhanshu Shekhar (StatDS).
Next position: Assistant Professor in EECS, Univ. Michigan
- 2022-23 Aditya Gangrade (StatDS, joint with A. Rinaldo).
Next position: Postdoctoral researcher, Univ. Michigan
- 2019-20 Eugene Katsevich (StatDS, joint with K. Roeder).
Next position: Assistant Professor, Wharton (UPenn) Statistics
- 2018-19 Asaf Weinstein (StatDS, joint with M. Gavish).
Next position: Assistant Professor, HUJI Statistics

Graduated PhD students

- 2024 Ian Waudby-Smith (StatDS; externals: S. Murphy, S. Wager),
Topic: Anytime-valid sequential inference [Amazon Fellowship](#).
Next position: Postdoctoral researcher, UC Berkeley
- 2023 Aleksandr Podkopaev (StatDS+MLD; externals: R. Barber, S. Kasivishwanathan),
Topic: Uncertainty quantification under distribution shifts.
Next position: Data Scientist, Walmart
- 2023 Chirag Gupta (MLD; externals: D. Foster, V. Perchet),
Topic: Post-hoc calibration without distributional assumptions [Bloomberg Fellowship](#).
Next position: Data Scientist, Bloomberg
- 2023 YJ Choe (StatDS+MLD; externals: J. Ziegel, A. d'Amour),
Topic: Comparing sequential forecasters and abstaining classifiers.
Next position: Postdoc, UChicago
- 2021 Boyan Duan (StatDS, joint with L. Wasserman; externals: P. Grunwald, W. Fithian),
Thesis: Advances in interactive testing.
Next position: Data Scientist, Google
- 2021 Robin Dunn (StatDS, joint with L. Wasserman; externals: S. Murphy, R. Martin),
Thesis: Advances in universal inference [NSF Fellowship](#).
Next position: Data Scientist, Novartis
- 2020 Jaehyeok Shin (StatDS, joint with A. Rinaldo; externals: G. Lugosi, S. Rakhlin),
Thesis: Bias of the sample mean in multi-armed bandits.
Next position: Data Scientist, Google

Soon-to-graduate (post-proposal) PhD student advisees

- 2024 Justin Whitehouse (CSD, joint with Steven Wu),
Topic: Modern martingale methods for sequential estimation [NSF Fellowship](#).
- 2025 Ojash Neopane (MLD, joint with Aarti Singh),
Topic: Advances in bandit algorithms and policy evaluation [NSF Fellowship](#).

Pre-proposal PhD student advisees

- 2026 Neil Xu (StatDS),
Topic: Advances in post-selection inference with e-values.
- 2026 James Leiner (StatDS),
Topic: Selective inference with a human-in-the-loop.
- 2027 Ben Chugg (MLD),
Topic: Anytime-valid sequential inference [NSERC Fellowship](#).
- 2028 Hongjian Wang (StatDS),
Topic: Anytime-valid sequential inference.
- 2027 Michael Wieck-Sosa (StatDS),
Topic: High-dimensional inference for time series.
- 2028 Tomas Gonzalez Lara (MLD, joint with Giulia Fanti),
Topic: Private and federated optimization for generative models.

PhD Thesis Committees

- 2024 Margaux Zaffran (Stat, Ecole Poly., Paris)
- 2023-24 Weichen Wu (StatDS)

2022-23	Wanshan Li	(StatDS)
2021-23	David Zhao	(StatDS+MLD)
2021-22	Costin Bădescu	(CSD)
2021-22	Heejong Bong	(StatDS+Neuro)
2021-22	Ben LeRoy	(StatDS)
2021-22	Ron Yurko	(StatDS)
2020-22	Natalia Lombardi De Oliveira	(StatDS)
2020-21	Ciaran Evans	(StatDS)
2020-21	Alan Mishler	(StatDS)
2020-21	Danijel Kivaranovic	(Stat, University of Vienna)
2019-20	Rianne de Heide	(CS, CWI Amsterdam)
2018-20	Ilmun Kim	(StatDS)
2018-20	Kevin Tran	(ChemE)

PhD Advanced Data Analysis Projects

2024	Hongjian Wang <i>Area: CRISPR screening.</i>	(StatDS, joint with Barbara Engelhardt),
2023	Ben Chugg <i>Area: Coup forecasting.</i>	(MLD, joint with John Chin),
2023	Michael Wieck-Sosa <i>Area: Covid forecasting.</i>	(StatDS, joint with Michel Haddad),
2022	Neil Xu <i>Area: Real-estate auditing.</i>	(StatDS, joint with John Silvestri, Barbara Stern),
2022	James Leiner <i>Area: Causal DAGs and multiple testing.</i>	(StatDS, joint with Wesley Tansey),
2020	Ian Waudby-Smith <i>Area: Post-election auditing.</i>	(StatDS, joint with Philip Stark),
2019	Nil-jana Akpınar <i>Area: Educational data mining.</i>	(StatDS, joint with Umut Acar),

Masters Capstone Projects

2020	Radhika Khandelwal, Surya Sindwani, Xiaofan Xu, Muhammad Yafi, Zhe Fei	(Heinz)
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Service

Organization: full- or multi-day workshops and conferences

2025	5-day Workshop on safe anytime-valid inference (BIRS, Chennai), <i>Organizer.</i> + Ruodu Wang, Johanna Ziegel, Peter Grunwald.
2024	5-day Workshop on safe anytime-valid inference (Oberwolfach, Germany), <i>Organizer.</i> + Ruodu Wang, Johanna Ziegel, Peter Grunwald.
2022	1-day Workshop on Distribution-free Uncertainty Quantification (ICML), <i>Organizer.</i> + Anastasios Angelopoulos, Stephen Bates, Sharon Li, Ryan Tibshirani.
2022	3-day Workshop on probabilistic calibration (CMU), <i>Lead organizer.</i> + Dean Foster.
2022	5-day Workshop on safe anytime-valid inference (EuRandom, Eindhoven), <i>Organizer.</i> + Peter Grunwald.
2021	1-day Workshop on Distribution-free Uncertainty Quantification (ICML), <i>Organizer.</i> + Anastasios Angelopoulos, Stephen Bates, Sharon Li, Ryan Tibshirani.
2020	2-day Workshop on statistical learning theory (TIFR, Mumbai), <i>Organizer.</i> + Sandeep Juneja, Devavrat Shah.
2018-22	3-week working group on conformal prediction (AIM Square), <i>Organizer.</i> + Ryan Tibshirani, Rina Barber, Emmanuel Candes.
2016	1-day Workshop on Adaptive Data Analysis (NeurIPS), <i>Organizer.</i> + Adam Smith, Aaron Roth, Vitaly Feldman.

- 2016 1-day Workshop on Modern Nonparametrics (NeurIPS), *Organizer*.
+ Zoltan Szabo, Han Liu, Mladen Kolar, Samory Kpotufe, Bharath Sriperumbudur, John Lafferty.
- 2015 1-day Workshop on Active Learning: Theory & Practice (ICML), *Organizer*.
+ Akshay Krishnamurthy, Aarti Singh, Nina Balcan.
- 2014 1-day Workshop on Optimization in Machine Learning (NeurIPS), *Organizer*.
+ Alekh Agarwal, Suvrit Sra, Miro Dudik, Zaid Harchaoui, Martin Jaggi.

Organization: individual sessions at meetings

- 2024 Invited session: e-values and p-values; contrasts and synergies (ICSIDS), *Organizer*.
- 2024 Invited session: statistical challenges for adaptive experimentation (JSM), *Organizer*.
- 2023 Invited session: algorithms+analysis of adaptively randomized experiments (JSM), *Organizer*.
- 2023 Invited session: advances in anytime-valid inference (IISA), *Organizer*.
- 2023 Invited session: martingale methods in modern statistics (CLAPEM), *Organizer*.
- 2022 Invited session: game-theoretic statistics (IMS Annual Meeting), *Organizer*.
- 2021 Invited session: statistical inference by betting (JSM, IMS), *Organizer*.
- 2019 Invited session: sequential analysis (Asilomar), *Organizer*.

Senior Program Committee

- 2025 36th Intl. Conf. on Algorithmic Learning Theory (ALT), *Area Chair*.
- 2024 11th Intl. Conf. on Learning Representations (ICLR), *Emergency Area Chair*.
- 2023 39th Conf. on Uncertainty in Artificial Intelligence (UAI), *DEI Chair*.
- 2022 38th Conf. on Uncertainty in Artificial Intelligence (UAI), *Sponsorship Chair*.
- 2022 9th Intl. Conf. on Learning Representations (ICLR), *Area Chair*.
- 2022 33rd Intl. Conf. on Algorithmic Learning Theory (ALT), *Meta-Reviewer*.
- 2021 34th Annual Conf. on Learning Theory (COLT), *Meta-Reviewer*.
- 2021 37th Conf. on Uncertainty in Artificial Intelligence (UAI), *Area Chair*.
- 2020 34th Conf. on Neural Information Processing Systems (NeurIPS), *Area Chair*.
- 2020 33rd Annual Conf. on Learning Theory (COLT), *Meta-Reviewer*.
- 2020 37th Intl. Conf. on Machine Learning (ICML), *Area Chair*.
- 2020 31st Intl. Conf. on Algorithmic Learning Theory (ALT), *Meta-Reviewer*.
- 2020 36th Conf. on Uncertainty in Artificial Intelligence (UAI), *Area Chair*.
- 2019 33rd Conf. on Neural Information Processing Systems (NeurIPS), *Area Chair*.
- 2019 22nd Conf. on AI & Statistics (AISTATS), *Area Chair*.
- 2019 36th Intl. Conf. on Machine Learning (ICML), *Area Chair*.
- 2019 32nd Annual Conf. on Learning Theory (COLT), *Meta-Reviewer*.
- 2017 20th Conf. on AI & Statistics (AISTATS), *Publicity Chair*.

Guest Editor

- 2023-24 [Special Issue on Game-Theoretic Statistics and Safe Anytime-Valid Inference](#).
+Peter Grunwald, for New England Journal of Statistics in Data Science
- 2024-25 [Special Issue on Conformal Prediction and Distribution-free Uncertainty Quantification](#).
+Henrik Boström, Ulf Johansson, Khuong An Nguyen, for Machine Learning Journal

Associate Editor

- 2024- ACM/IMS Journal on Data Science
- 2023- Sankhya, the Indian Journal of Statistics
- 2024- Foundations and Trends in Machine Learning

Book Reviewer

- Stat Cambridge University Press
- ML Foundations and Trends in Machine Learning

Miscellaneous

- 2020 NSF DMS Grant Review Panel
- 2020-23 arXiv StatML moderator

Journal Reviewer

- Stat Annals of Statistics, Journal of the Royal Statistical Society Series B (JRSSB), Biometrika, Bernoulli, Statistics and Probability Letters, Annals of Applied Statistics, Journal of the American Statistical Association, Statistica Sinica, Statistical Science, Scandinavian Journal of Statistics, Electronic Journal of Statistics, Annals of the Institute of Statistical Mathematics, The American Statistician.
- ML/AI Journal of Machine Learning Research, Machine Learning Journal, Journal of Artificial Intelligence Research, Data Mining and Knowledge Discovery.
- EE IEEE Transactions on Information Theory, IEEE Signal Processing Letters, IEEE Transactions on Pattern Analysis and Machine Intelligence.
- Opt. BIT Numerical Algorithms, Optimization Methods and Software, Numerical Mathematics, SIAM Journal on Matrix Analysis.
- Other Bioinformatics, Discrete and Computational Geometry, Entropy.

Conference Reviewer

- ML Conference on Learning Theory (COLT), Conference on AI & Statistics (AISTATS), International Conference on Machine Learning (ICML), Neural Information Processing Systems (NeurIPS), European Conference on Machine Learning (ECML).
- AI Conference on Artificial Intelligence (AAAI), Conference on Uncertainty in Artificial Intelligence (UAI), International Joint Conference on Artificial Intelligence (IJCAI).
- Other Intl. Symp. on Information Theory (ISIT), Math. and Scientific Machine Learning (MSML).

Department Service

- 2022 StatDS research workshop organizer (Dean Foster)
- 2022 MLD extended hiring committee
- 2021-24 StatDS faculty senator
- 2020- StatML faculty advisor and course review committee
- 2021- StatDS research committee
- 2020-24 MLD department review committee
- 2020- SCS distinguished speaker seminar committee
- 2018-22 StatDS department seminar organizer
- 2019-24 MLD speaking skills committee
- 2019-23 Trained social host for events with alcohol (StatDS+MLD)
- 2018- Wellness network (StatDS+MLD)
- 2018-21 Miscellaneous: judge, Meeting of the Minds (2019), first day StatDS retreat organizer (2018)
- 2015-16 Graduate admissions committee, CS Department (UCB)
- 2014 Lead Organizer, ML Department Student Research Symposium (CMU)
- 2012-15 Organizer, weekly lunch seminar series on ML (CMU)
- 2014-15 Teaching Faculty Hiring Committee, ML Department (CMU)
- 2014-15 Graduate Student Assembly Rep. (CMU), [Outstanding Representative Award](#)
- 2013-14 Graduate Admissions Committee, ML Department (CMU)
- 2013-14 Education Review Committee Founder, ML Department (CMU)

University Service

- 2022 Panel Discussant on Voting and Elections for Alumni Outreach (CMU)
- 2020 Panel Discussant on Voting and Elections for Alumni Outreach (CMU)
- 2015-17 Steward for Postdoctoral Union (UCB)
- 2014-15 SafeZone Allies for LGBTQ Safety, Trained Member (CMU)
- 2014-15 Campus Smoking Policy Review Committee, Member (CMU)
- 2012-13 Explorer's Club Core Officer (CMU)

Outreach (University)

2024	Podcast interview on sequential experimentation (50 mins, Casual Inference podcast)	
2023-	COPSS Emerging Leader Award Committee	
2022-	IMS Outreach Committee	
2022	AISTATS Diversity and Inclusion mentoring (how to read papers)	(1 hour, online)
2022	Learning Theory Alliance mentoring (how to read papers)	(1 hour, online)
2021	Ask-me-anything mentoring sessions	(1 hour x 3 times, online)
2021	Grad-school application mentoring session	(1 hour, online)
2021	Learning Theory Alliance mentoring (discussion moderator)	(1 hour, online)

Outreach (Schools)

2023	Introduction to ML and data science (60 mins, high school, Shanti Bhavan, Bangalore)	
2022	Podcast interview on data science (30 mins, high school, NC School of Science and Math.)	
2020	Election polling: bias and variance (40 mins, grade twelve, Winchester Thurston, Pittsburgh)	
2019	Introduction to ML	(40 mins, grade twelve, Vidya Mandir Mylapore, Chennai)
2017	Introduction to AI	(40 mins, grade eleven, Vidya Mandir Mylapore, Chennai)
	Trash-free Living	(60 mins, full school, Paathashaala, Chennai)
2016	Robots that run	(60 mins, grade three, Stege Elementary, Richmond)
2015	SVD, Random Graphs and Random Walks	(90x3 mins, high school, PACT, Princeton)
	Introduction to CS	(90x2 mins, middle school girls, Technights, CMU)
	Introduction to ML	(30x2 mins, high school, Indian School Al-Ghubra, Muscat)
2014	Mechanism Design: Auctions & Voting	(80 mins, high school, Andrew's Leap, CMU)
2013	Multi-armed Bandits	(80 mins, high school, Andrew's Leap, CMU)

Distractions

- **Endurance sports.** Completed Ironman triathlon (2.4mi swim, 112mi bike, 26.2mi run) at Louisville, Kentucky (Aug 25, '13). Completed half-ironman in Grafham ('12), olympic triathlons in Marlow ('12), Pittsburgh ('13), Tahoe ('16), and marathons in Columbus ('12) and Pittsburgh ('12, '13, '14), and half-marathons in Wales ('12), Philadelphia ('13), Chicago ('13), Ealing ('14), Berkeley ('15), Napa ('17), Pittsburgh ('22, '23, '24).
- **Team sports.** Represented the Oman cricket team in the U-13 Gulf Cup (silver medal), and in the U-15 Asia Cup (ranked 5/14). Also played several years for the IIT Bombay Inter-IIT (silver medal) and Carnegie Mellon cricket teams. Awarded several Hostel-3 Sports Colors for winning top-3 spots in table-tennis, badminton, cricket, basketball and water-polo.
- **Adventure sports.** Finished a 26-day Basic Mountaineering Course in the Himalayas (Jul 1-26, '06), a 10-day backpacking school ('13) and 15-day climbing school by the Explorer's Club of Pittsburgh ('15). Also completed a 7-day PADI scuba openwater diving course ('11), and a 2-day Advanced Free Fall Skydiving course ('10), and a 2-day wilderness first aid course ('12).
- **Community service.** Raised funds in '18 for organizations fighting AIDS and empowering women in Zambia (340 mile bike ride from Lusaka to Livingstone). Fundraising in '16 and '17 for the San Francisco AIDS Foundation and the Los Angeles LGBT Center (545 mile bike ride in California from SF to LA, also training ride leader in '17). Also fundraised for the National Multiple Sclerosis Society (150 mile bike ride in Pennsylvania, '13, and in '21) and the Pittsburgh Animal Rescue League and Wildlife Center (Pittsburgh marathon, '12). Regular volunteer for beach cleaning and daily school traffic warden for 3 years (2001-03).