

# Arun Kumar Kuchibhotla

---

## Contact Information

Department of Statistics and Data Science  
Carnegie Mellon University  
Email: arunku@cmu.edu  
Website: <https://arun-kuchibhotla.github.io/>

## Research Interests

Post-selection Inference, Large Sample Theory, Conformal Prediction, Concentration Inequalities.

## Academic Positions

Assistant Professor, Department of Statistics & Data Science, Carnegie Mellon University  
2020 — current.

## Education

- University of Pennsylvania: Ph.D. in Statistics 2015–2020  
*Thesis Advisors:* (Late) Lawrence D. Brown, Andreas Buja.
- University of Pennsylvania: Master of Arts in Statistics 2015–2016
- Indian Statistical Institute: Master of Statistics (Distinction) 2013–2015  
*Specialization:* Mathematical Statistics and Probability
- Indian Statistical Institute: Bachelor of Statistics (Distinction) 2010–2013

## Journal Publications

1. **Kuchibhotla A. K.** and Basu A. (2015) “A General Set Up for Minimum Disparity Estimation.” *Statistics and Probability Letters*, Vol. 96, 68-74.
2. **Kuchibhotla A. K.** and Basu A. (2017) “On The Asymptotics of Minimum Disparity Estimation.” *TEST*, 26 (3):481–502.
3. **Kuchibhotla A. K.**, Mukherjee S. and Basu A. (2017) “Statistical inference based on bridge divergences.” *Annals of the Institute of Statistical Mathematics*, 71 (3), 627-656.
4. Berk R., Buja A., Brown L. D., George E. I., **Kuchibhotla A. K.**, Su W. J., Zhao L. H., (2019) “Assumption Lean Regression” *The American Statistician*, 1-17.
5. Buja A., Brown L. D., **Kuchibhotla A. K.**, Berk R., George E. I., Zhao L. H. (2019) “Models as Approximations – Part II: A General Theory of Model-Robust Regression” *Statistical Science*, 34(4), 545–565.
6. Bellec P., and **Kuchibhotla A. K.**, (2019) “First order expansion of convex regularized estimators” *Advances in Neural Information Processing Systems 32*. Pages 3462–3473.
7. **Kuchibhotla A. K.**, Brown L. D., Buja A., Cai, J., George E.I., Zhao L.H. (2019) “Valid Post-selection Inference in Model-free Linear Regression.” *Annals of Statistics*, 48(5), 2953–2981.
8. **Kuchibhotla A. K.** and Parta R. K. (2020) “Efficient Estimation in Single Index Models through Smoothing splines” *Bernoulli*, 26(2), 1587–1618.
9. **Kuchibhotla A. K.**, Banerjee D., Mukherjee S. (2021) “High-dimensional CLT: Improvements, Non-uniform Extensions and Large Deviations” *Bernoulli*, 27(1): 192-217.
10. **Kuchibhotla A. K.** and Zheng Q. (2021) “Near-Optimal Confidence Sequences for Bounded Random Variables” *arXiv:2006.05022*. *Proceedings of the 38th International Conference on Machine Learning*, PMLR 139:5827-5837.
11. **Kuchibhotla A. K.**, Patra R. K., Sen B. (2021) “Semiparametric Efficiency in Convexity Constrained Single Index Model” *arXiv:1708.00145*. Accepted at *Journal of American Statistical Association*.

12. **Kuchibhotla A. K.**, Brown L. D., Buja A., George E.I., Zhao L.H. (2021) “A Model Free Perspective for Linear Regression: Uniform-in-model Bounds for Post Selection Inference” [arXiv:1802.05801](#). Accepted at *Econometric Theory*.
13. Gupta C., **Kuchibhotla A. K.**, and Ramdas. A. (2021) “Nested conformal prediction and quantile out-of-bag ensemble methods” [arXiv:1910.10562](#). Accepted at *Pattern Recognition*.
14. **Kuchibhotla A. K.** and Patra R. K. (2021) “On Least Squares Estimation under Heteroscedastic and Heavy-Tailed Errors” [arXiv:1909.02088](#). Accepted at *Annals of Statistics*.
15. **Kuchibhotla A. K.**, Kolassa J. E., and Kuffner T. A. (2022) “Post-selection Inference” *Annual Review of Statistics and Its Application*, Volume 9.
16. Ogburn E. L., Cai J., **Kuchibhotla A. K.**, Berk R. A., Buja A. (2022) “A few practical issues concerning assumption-lean inference for generalized linear models” [Comment on “Assumption-lean inference for generalised linear model parameters”] Accepted at *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*.

## Preprints

1. **Kuchibhotla A. K.**, Chakraborty A. (2018) “Moving Beyond Sub-Gaussianity in High-Dimensional Statistics: Applications in Covariance Estimation and Linear Regression” [arXiv:1804.02605](#). Minor revision at *Information and Inference: a Journal of the IMA*.
2. Chakraborty A. and **Kuchibhotla A. K.** (2018) “Tail Bounds for Canonical U-Statistics and U-Processes with Unbounded Kernels”
3. **Kuchibhotla A. K.**, Brown L. D., Buja A. (2018) “Model-free Study of Ordinary Least Squares Linear Regression” [arxiv:1809.10538](#).
4. **Kuchibhotla A. K.** (2018) “Deterministic Inequalities for Smooth M-estimators” [arxiv:1809.05172](#).
5. **Kuchibhotla A. K.** (2020) “Exchangeability, Conformal Prediction, and Rank Tests” [arXiv:2005.06095](#). Revision submitted to *Statistical Science*.
6. **Kuchibhotla A. K.**, Rinaldo A., and Wasserman L. (2020) “Berry-Esseen Bounds for Projection Parameters and Partial Correlations with Increasing Dimension” [arXiv:2007.09751](#). Revision submitted to the *Annals of Statistics*.
7. **Kuchibhotla A. K.** and Rinaldo, A. (2020) “High-dimensional CLT for Sums of Non-degenerate Random Vectors:  $n^{-1/2}$ -rate” [arXiv:2009.13673](#).
8. **Kuchibhotla A. K.** and Berk R. A. “Nested Conformal Prediction Sets for Classification with Applications to Probation Data” [arXiv:2104.09358](#). Minor revision at the *Annals of Applied Statistics*.
9. Yang Y., and **Kuchibhotla A. K.** (2021) “Finite-sample Efficient Conformal Prediction” [arXiv:2104.13871](#). Submitted to the *Journal of the American Statistical Association*.
10. **Kuchibhotla A. K.**, Balakrishnan, S., and Wasserman L. (2021) “The HulC: Confidence Regions from Convex Hulls” [arXiv:2105.14577](#). Submitted to the *Journal of Royal Statistical Society: Series B (Statistical Methodology)*.
11. **Kuchibhotla A. K.** (2021) “Median bias of M-estimators” [arXiv:2106.00164](#).
12. Berk R., **Kuchibhotla A. K.**, and Tchetgen Tchetgen E. J. (2021) “Improving Fairness in Criminal Justice Algorithmic Risk Assessments Using Optimal Transport and Conformal Prediction Sets” [arXiv:2111.09211](#).
13. Fogliato R., Shrotriya S., and **Kuchibhotla A. K.** “maars: Tidy Inference under the ‘Models as Approximations’ Framework in R” [arXiv:2106.11188](#).
14. Yang Y., **Kuchibhotla A. K.**, and Tchetgen Tchetgen E. J. (2022) “Doubly Robust Calibration of Prediction Sets under Covariate Shift.” [arxiv:2203.01761](#).

## Working Papers

1. **Kuchibhotla A. K.**, Balakrishnan, S., and Wasserman L. (2022) “A new notion of regularity of an estimator and its equivalence with valid inference.”
2. Yang Y., **Kuchibhotla A. K.**, and Tchetgen Tchetgen E. J. (2022) “Minimax optimal non-parametric regression for missing data and CATE estimation.”
3. Hong A., and **Kuchibhotla A. K.** (2022) “Statistical Practice: Examples and Issues of Reproducibility.”
4. **Kuchibhotla A. K.**, and Mukherjee S. S. (2022) “Sharp Maximal Inequalities.”

## Teaching

- 46-929, CMU – Financial Time Series Analysis (Spring 2022)
- 36-761, CMU – Modern Theory of Linear Regression (Fall 2021)
- 36-760, CMU – Central Limit Theorems and Resampling (Fall 2021)
- 37-761, CMU – Modern Theory of Linear Regression (Fall 2020)
- 36-760, CMU – Concentration Inequalities and CLTs (Fall 2020)
- STAT991, UPenn – Topics in Linear Models (Fall 2017)
- STAT111, UPenn – Introductory Statistics (Summer 2018)

## Presentations

- Biostatistics department seminar (2022): [Virginia Commonwealth University](#).
- Statistics department seminar (2022): [The Wharton School, University of Pennsylvania](#).
- Invited talk at [56th Annual Conference on Information Sciences and Systems \(CISS 2022\)](#).
- Statistics department seminar (2022): [Interdisciplinary Statistical Research Unit, ISI, Kolkata](#).
- Statistics department seminar (2022): [University of Bristol](#).
- Statistics department seminar (2021): [University of Wisconsin–Madison](#).
- Biostatistics department seminar (2021): [Johns Hopkins University](#).
- Statistics department seminar (2021): [McGill University](#).
- Department seminar (2021): [Indian Institute of Management, Bangalore](#).
- Invited talk at [ICSA 2021: Applied Statistics Symposium](#).
- Invited talk at [World Statistics Congress 2021](#).
- Invited talk at [International Indian Statistical Association 2021](#).
- Invited talk at [International Seminar on Selective Inference 2020](#).
- Statistics department seminar (2020): [University of Chicago](#).
- Department seminar (2020): University of Chicago Booth School of Business.
- Department seminar (2020): [Harvard T.H. Chan School of Public Health](#).
- Statistics department seminar (2020): [University of British Columbia](#).
- Statistics department seminar (2020): University of California, Irvine.
- Statistics department seminar (2020): Rutgers University.
- Invited talk at [MCP 2019](#), National Taiwan University.
- Invited talk at [WHO-PSI-4](#), 2019.
- Invited talk at [JSM 2019](#), Denver.
- Invited talk at [ICSA 2019](#), Nankai University.

- Invited talk at young researchers session, [Lawrence D Brown memorial workshop](#).
- Shared a talk with Andreas Buja at [WHOA-PSI-3](#), 2018.
- Invited talk at [Workshop Model Selection, Regularization, and Inference](#) 2018 (Represented Larry Brown).
- Shared a talk with Andreas Buja at [SLDSC 2018](#).
- Invited talk at [WHOA-PSI-2](#), 2017 (Represented Larry Brown).
- Special topics session at [World Statistics Congress 2015](#), Rio de Janeiro, Brazil.
- Contributed session presentation at [ICORS 2015](#), Kolkata, India.
- Contributed session presentation at [ICORS 2014](#), Halle, Germany.

### Academic Achievements

- NSF grant, [DMS-2113611](#) (2021–2024, \$300,000), “Central Limit Theorems and Inference in High Dimensions.” (Joint with Alessandro Rinaldo).
- Student travel award, Wharton Doctoral Programs, George James Term Fund 2019.
- Got second prize in [Jan Tinbergen](#) competition for young statisticians from developing countries.
- Awarded [Kishore Vaigyanik Protsahan Yojana](#) scholarship (2011–2015).
- Inspire Scholar since April 2011. (From Department of Science and Technology, India)

### Committees

- Served as one of the judges for International Indian Statistical Association (IISA) student paper competition for the Probability/Theory/Methodology section 2020.
- Served on the Statistical Learning and Data Science (SLDS) 2021 Student Paper Award committee.

### PhD students

- Xiaoyi Gu (co-advised with Alessandro Rinaldo). Currently at Amazon.

**Journal Review** Served as a reviewer for several statistical journals:

- Annals of Statistics;
- Journal of American Statistical Association;
- Biometrika;
- Journal of the Royal Statistical Society: Series B (Statistical Methodology);
- Bernoulli;
- Information and Inference;
- Statistica Sinica;
- Electronic Journal of Statistics;
- Statistical Science;
- Statistical Papers;
- Statistics and Computing;

Also, served as a reviewer for machine learning conferences including COLT (conference on learning theory), UAI (Uncertainty in Artificial Intelligence).

### Programming and Scripting

- R – Proficient,
- C – Basic Programming,
- Python – Basic Programming.