

WHEN STATISTICS MEETS COMPUTING: A FEW INTERESTING PROBLEMS AND CHALLENGES

In the conventional statistical framework, the goal is to develop optimal statistical procedures, where the optimality is understood with respect to the sample size and parameter space. However, in many contemporary applications, nonstatistical concerns such as computational, communication, and privacy constraints associated with the statistical procedures come to the forefront. A fundamental question in data science is: How to make optimal statistical inference under these nonstatistical constraints?

In this talk, we discuss some recent advances on differentially private learning, distributed learning under communication constraints, and interplay between statistical accuracy and computational efficiency in a few specific settings. The results show some interesting and novel phenomena and point to directions that are worthy further investigation.

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Location | LT33 @ Blk S17, Level 2, NUS



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Tony Cai is Daniel H. Silberberg Professor of Statistics and Data Science at The Wharton School of the University of Pennsylvania. He served as Editor of The Annals of Statistics from 2010 to 2012. He has held Associate Editor positions in various journals including the Journal of the Royal Statistical Society: Series B, Journal of the American Statistical Association (2005–2010), and The Annals of Statistics (2004–2009). Tony Cai has made fundamental contributions to high-dimensional statistical inference, adaptive nonparametric function, and minimax optimality. His outstanding mentorship and exceptional leadership to the statistical profession have led to numerous awards including the Fellow of IMS (2006), COPSS Presidents' Award (2008), ICCM Best Paper Award (2018), and Distinguished Achievement Award by the International Chinese Statistical Association (2019).