DISTINGUISHED LECTURE

Supervised Homogeneity Pursuit via Mixed Integer Optimization

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Fellow of the Institute of Mathematical Statistics, 2021
Fellow of the American Statistical Association, 2018
John-von-Neumann Professorship, Technical University of Munich, Germany, 2013
Elected Member of International Statistical Institute, 2011
Outstanding Performance Award, University of Waterloo, 2006
The Dean's Award of Outstanding Teaching, York University, 2002
Excellence of Performance Award (the First Prize), York University, Canada, 2001

Date: 6 July 2023 (Thursday)
Time: 2:30 pm — 3:30 pm
Venue: LT2, Lady Shaw Building,
        The Chinese University of Hong Kong

Abstract

Stratification is one statistical principle in data processing to mitigate the underlying population heterogeneity, which is typically handled by clustering when stratum labels are unknown. Many practical problems require post-clustering statistical learning that is challenged by the issue of "double data dipping", leading to the difficulty of uncertainty quantification. One solution to address this challenge is to perform a simultaneous operation of clustering and estimation in data analyses. Recently we developed a new paradigm of supervised homogeneity pursuit via mixed integer optimization, which provides a conceptually simple and computationally straightforward machinery with the use of suitable constraints in optimization. This novel toolbox has been then applied to solve several real-world problems arising from infectious disease surveillance, influence of environmental exposure to health, and risk factors for aging. Some algorithmic limitations worth future research will be discussed.

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