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1. Review

The authors comprehensively review the current literature of sparse sufficient dimension reduction in three main settings: sparse estimation in sufficient dimension reduction when $p < n$; sparse estimation in sufficient dimension reduction when $p > n$; variable screening in ultra-high dimensional setting. In my opinion, this review paper contributes tremendously to the literature because sparse sufficient dimension reduction is of great importance as a model-free variable selection approach. The authors not only summarise a huge amount of current research works, but also organise them in a clear manner.

Although lots of breakthroughs in sparse sufficient dimension reduction have been accelerated and mostly focused on the estimation part, there are still many unresolved issues and challenges. For example, the inference study after model selection in sufficient dimension reduction is scant. Since sufficient dimension reduction is model-free approach, it posts

serious challenges in the inference studies, especially in high-dimensional settings. Another important issue is that the hypothesis testing for structural dimension in high-dimensional settings. We would expect that this review paper along with discussions will encourage more excellent researchers turn to this exciting area of sparse sufficient dimension reduction.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Notes on contributor

Dr. Xin Chen is an associate professor from Dept. of Statistics and Data Science in Southern University of Science and Technology, China. He got his bachelor degree from Nankai University and his Ph.D degree from University of Minnesota. His research interests include dimension reduction, variable selection and high dimensional analysis.