Covariate-Assisted Matrix Completion with Multiple Structural Breaks

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Nowadays a great deal of data conveniently taken from collection and accumulation, they have different sources, during different period of time, experiencing different implements of gathering. Thus, it is meaningful of studying the heterogeneity of high dimensional data. In matrix completion, additional covariates often provide valuable information for completing the unobserved entries of a high-dimensional low-rank matrix. In this talk, we consider the matrix recovery problem when there are multiple structural breaks in the coefficient matrix brought by covariates. A cumulative sum (CUSUM) statistic is constructed based on the penalized coefficient estimation. Then the CUSUM is incorporated into the Wild Binary Segmentation (WBS) algorithm to consistently estimate the location of breaks. Consequently, a nearly-optimal recovery is fulfilled. Theoretical findings are further corroborated via numerical experiments and a real-data application.

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