

Combinatorial data analysis: optimization by dynamic programming

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Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20449095&lokasi=lokal>

Abstrak

Combinatorial data analysis (CDA) refers to a wide class of methods for the study of relevant data sets in which the arrangement of a collection of objects is absolutely central. The focus of this monograph is on the identification of arrangements, which are then further restricted to where the combinatorial search is carried out by a recursive optimization process based on the general principles of dynamic programming (DP). The authors provide a comprehensive and self-contained review delineating a very general DP paradigm or schema that can serve two functions. First, the paradigm can be applied in various special forms to encompass all previously proposed applications suggested in the classification literature. Second, the paradigm can lead directly to many more novel uses. An appendix is included as a user's manual for a collection of programs available as freeware.

The incorporation of a wide variety of CDA tasks under one common optimization framework based on DP is one of the book's strongest points. The authors include verifiably optimal solutions to nontrivially sized problems over the array of data analysis tasks discussed.