1. Record Nr.	UNINA9910735788803321
Autore	Mukhametzyanov Irik Z.
Titolo	Normalization of Multidimensional Data for Multi-Criteria Decision Making Problems : Inversion, Displacement, Asymmetry / / by Irik Z. Mukhametzyanov
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2023
ISBN	3-031-33837-5
Edizione	[1st ed. 2023.]
Descrizione fisica	1 online resource (314 pages)
Collana	International Series in Operations Research & Management Science, , 2214-7934 ; ; 348
Disciplina	705 519.542
Soggetti	Operations research Management science Computer science—Mathematics Operations Research and Decision Theory Operations Research, Management Science Mathematical Applications in Computer Science Presa de decisions multicriteri Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Introduction -- The MCDM Rank Model -- Normalization and rank model MCDM -- Linear Methods for Multivariate Normalization -- Inversion of normalized values. ReS-algorithm -- Rank Reversal in MCDM Models. Contribution of the normalization -- Coordination of scales of normalized values. IZ-method MS-transformation of Z-Score -- Nonlinear multivariate normalization methods -- Normalization for the case "Nominal value the best" -- Comparative results of ranking of alternatives using different normalization methods. Computational experiment -- 12 Significant difference of the performance indicator of alternatives -- Conclusion.
Sommario/riassunto	This book presents a systematic review of multidimensional normalization methods and addresses problems frequently

encountered when using various methods and ways to eliminate them. The invariant properties of the linear normalization methods presented here can be used to eliminate simple problems and avoid obvious errors when choosing a normalization method. The book introduces valuable, novel techniques for the multistep normalization of multidimensional data. One of these methods involves inverting the normalized values of cost attributes into profit attributes based on the reverse sorting algorithm (ReS algorithm). Another approach presented is the IZ method, which addresses the issue of shift in normalized attribute values. Additionally, a new method for normalizing the decision matrix is proposed, called the MS method, which ensures the equalization of average values and variances of attributes. Featuring numerous illustrative examples throughout, the book helps readers to understand what difficulties can arise in multidimensional normalization, what to expect from such problems, and how to solve them. It is intended for academics and professionals in various areas of data science, computing in mathematics, and statistics, as well as decision-making and operations.