Record Nr.

 Autore
 Titolo
 Pubbl/distr/stampa
 ISBN
 9789811699856
 Edizione

UNISA996485661803316

 Shojima Kojiro
 Test Data Engineering [[electronic resource]]: Latent Rank Analysis, Biclustering, and Bayesian Network / / by Kojiro Shojima

Pubbl/distr/stampa
Singapore: , : Springer Nature Singapore: , : Imprint: Springer, , 2022
ISBN
9789811699856
[1st ed. 2022.]

Descrizione fisica 1 online resource (xxii, 579 pages) : illustrations

Collana Behaviormetrics: Quantitative Approaches to Human Behavior, , 2524-

4035 ; ; 13

Disciplina 519.542

Soggetti Social sciences - Statistical methods

Statistics

Political planning Psychometrics Machine learning

Statistics in Social Sciences, Humanities, Law, Education, Behavorial

Sciences, Public Policy

Statistical Theory and Methods

Public Policy Machine Learning Estadística bayesiana Anàlisi de conglomerats

Mineria de dades

Tests i proves en educació Processament de dades Visualització de la informació

Llibres electrònics

Lingua di pubblicazione Inglese

Formato Materiale a stampa

Livello bibliografico Monografia

Nota di bibliografia Includes bibliographical references.

Nota di contenuto Concept of Test Data Engineering -- Test Data and Item Analysis --

Classical Test Theory -- Item Response Theory -- Latent Class Analysis

-- Biclustering -- Bayesian Network Model.

Sommario/riassunto

This is the first technical book that considers tests as public tools and examines how to engineer and process test data, extract the structure within the data to be visualized, and thereby make test results useful for students, teachers, and the society. The author does not differentiate test data analysis from data engineering and information visualization. This monograph introduces the following methods of engineering or processing test data, including the latest machine learning techniques: classical test theory (CTT), item response theory (IRT), latent class analysis (LCA), latent rank analysis (LRA), biclustering (co-clustering), and Bayesian network model (BNM). CTT and IRT are methods for analyzing test data and evaluating students' abilities on a continuous scale. LCA and LRA assess examinees by classifying them into nominal and ordinal clusters, respectively, where the adequate number of clusters is estimated from the data. Biclustering classifies examinees into groups (latent clusters) while classifying items into fields (factors). Particularly, the infinite relational model discussed in this book is a biclustering method feasible under the condition that neither the number of groups nor the number of fields is known beforehand. Additionally, the local dependence LRA, local dependence biclustering, and bicluster network model are methods that search and visualize inter-item (or inter-field) network structure using the mechanism of BNM. As this book offers a new perspective on test data analysis methods, it is certain to widen readers' perspective on test data analysis. .