Matrix methods in data mining and pattern recognition

Elden, Lars, 1944- , author

Deskripsi Lengkap: https://lib.ui.ac.id/detail?id=20448883&lokasi=lokal

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Abstrak

Several very powerful numerical linear algebra techniques are available for solving problems in data mining and pattern recognition. This application-oriented book describes how modern matrix methods can be used to solve these problems, gives an introduction to matrix theory and decompositions, and provides students with a set of tools that can be modified for a particular application.

Matrix Methods in Data Mining and Pattern Recognition is divided into three parts. Part I gives a short introduction to a few application areas before presenting linear algebra concepts and matrix decompositions that students can use in problem-solving environments such as MATLAB. Some mathematical proofs that emphasize the existence and properties of the matrix decompositions are included. In Part II, linear algebra techniques are applied to data mining problems. Part III is a brief introduction to eigenvalue and singular value algorithms.

The applications discussed by the author are classification of handwritten digits, text mining, text summarization, pagerank computations related to the Google search engine, and face recognition. Exercises and computer assignments are available on a Web page that supplements the book.