

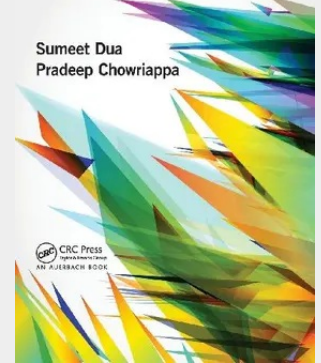
Data Mining for Bioinformatics

Covering theory, algorithms, and methodologies, as well as data mining technologies, Data Mining for Bioinformatics provides a comprehensive discussion of data-intensive computations used in data mining with applications in bioinformatics. It supplies a broad, yet in-depth, overview of the application domains of data mining for bioinformatics to help readers from both biology and computer science backgrounds gain an enhanced understanding of this cross-disciplinary field. The book offers authoritative coverage of data mining techniques, technologies, and frameworks used for storing, analyzing, and extracting knowledge from large databases in the bioinformatics domains, including genomics and proteomics. It begins by describing the evolution of bioinformatics and highlighting the challenges that can be addressed using data mining techniques. Introducing the various data mining techniques that can be employed in biological databases, the text is organized into four sections: - Supplies a complete overview of the evolution of the field and its intersection with computational learning - Describes the role of data mining in analyzing large biological databases—explaining the breath of the various feature selection and feature extraction techniques that data mining has to offer - Focuses on concepts of unsupervised learning using clustering techniques and its application to large biological data - Covers supervised learning using classification techniques most commonly used in bioinformatics—addressing the need for validation and benchmarking of inferences derived using either clustering or classification The book describes the various biological databases prominently referred to in bioinformatics and includes a detailed list of the applications of advanced clustering algorithms used in bioinformatics. Highlighting the challenges encountered during the application of classification on biological databases, it considers systems of both single and ensemble classifiers and shares effort-saving tips for model selection and performance estimation strategies.

Data Mining for Bioinformatics enables researchers to meet the challenge of mining vast amounts of biomolecular data to discover real knowledge. Covering theory, algorithms, and methodologies, as well as data mining technologies, it presents a thorough discussion of data-intensive computations used in data mining applied to bioinformatics. The book explains data mining design concepts to build applications and systems. Showing how to prepare raw data for the mining process, the text is filled with heuristics that speed the data mining process.

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