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3.5 Fuzzy Measure Similarity for Augmented Sets of Ontology Objects.
3.6 Choquet Fuzzy Integral Similarity Measure.; 3.7 Examples and Applications of Fuzzy Measure Similarity Using GO Terms; 3.7.1 Lymphoma case study; 3.7.2 Gene clustering using Gene Ontology annotations.; 3.7.3 Gene summarization using Gene Ontology terms.; 3.8 Ontology Similarity in Data Mining; 3.9 Discussion and Summary.; 4. Fuzzy Logic in Structural Bioinformatics; 4.1 Introduction; 4.2 Protein Secondary Structure Prediction.; 4.3 Protein Solvent Accessibility Prediction.
4.4 Protein Structure Matching Using Fuzzy Alignments 4.5 Protein Similarity Calculation Using Fuzzy Contact Maps; 4.6 Protein Structure Class Classification; 4.7 Summary.; 5. Application of Fuzzy Logic in Microarray Data Analyses.; 5.1 Introduction; 5.1.1 Microarray data description; 5.1.2 Microarray processing algorithms for gene selection and patient classification.; 5.1.3 Microarray processing algorithms for gene regulatory network discovery; 5.2 Clustering Algorithms; 5.2.1 (Dis)similarity measures for microarray data; 5.2.2 Fuzzy C-means (FCM); 5.2.3 Relational fuzzy C-means
5.2.4 Fuzzy co-clustering algorithms 5.3 Inferring Gene Networks Using Fuzzy Rule Systems; 5.4 Discussion and Summary.; 6. Other Applications.; 6.1 Overview; 6.2 Applications in Biological Sequence Analyses; 6.2.1 Protein sequence comparison; 6.2.2 Application in sequence family classification; 6.2.3 Application in motif identification.; 6.2.4 Application in protein subcellular localization prediction.; 6.2.5 Genomic structure prediction; 6.3 Application in Computational Proteomics; 6.3.1 Electrophoresis analysis.; 6.3.2 Protein identification through mass-spec; 6.4 Application in Drug Design.
6.5 Discussion and Summary.

Sommario/riassunto

Many biological systems and objects are intrinsically fuzzy as their properties and behaviors contain randomness or uncertainty. In addition, it has been shown that exact or optimal methods have significant limitation in many bioinformatics problems. Fuzzy set theory and fuzzy logic are ideal to describe some biological systems/objects and provide good tools for some bioinformatics problems. This book comprehensively addresses several important bioinformatics topics using fuzzy concepts and approaches, including measurement of ontological similarity, protein structure prediction/analysis, and