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Nota di contenuto	Holographic Imaging; Contents; Foreword: Holography; Foreword: Nerd Pride; Guide to Color Plates; Introduction: Why Holographic Imaging?; About This Volume; The Window View Upon Reality; References; Chapter 1: Holograms and Perception; Provoking Spatial Perceptions; Optical Information; Light as Waves and Rays; Capturing the Directions of Rays; Classical Optical Techniques; Holographic Direction Recording; Origins of Holography; Application Areas; Styles of Analysis; References; Chapter 2: Light as Waves; Light; Wave Shapes; Light as Repetitive Waves; Light as Sinusoidal Waves Coherence in WavesE&M Nature of the Waves; Intensity (Irradiance); Conclusions; References; Chapter 3: Waves and Phases; Introduction; Wave Phase; Radius of Curvature; Local Inclination and Divergence of a Complex Wave; Conclusions; Chapter 4: Two-Beam Interference; Introduction; Quantitative Discussion of Interference Contrast; Geometry of Interference Fringes; Simple Interference Patterns; Conclusions; References; Chapter 5: Diffraction; Introduction; Diffraction by Periodic Structures; Single-Slit Diffraction; Use of Lenses; Viewing Diffraction Patterns with the Eye

Styles of Diffraction Analysis Grating Equation; Spatial Frequency;  
 Grating Example; Off-Axis Grating Equation; Diffraction by a Sinusoidal  
 Grating; Conclusions; References; Chapter 6: Diffraction Efficiency of  
 Gratings; Introduction; Definition of Diffraction Efficiency; Transmission  
 Patterns; Thick Gratings; References; Chapter 7: "Platonic" Holography;  
 Introduction; Object Beam; Reference Beam; Interference Pattern;  
 Holographic Recording Material; Holographic Transmittance Pattern;  
 Illuminating Beam; A Proof of Holography; Other Reconstructed  
 Components; Arbitrary Wavefronts  
 Diffraction Efficiency Conclusions; References; Chapter 8: Ray-Tracing  
 Analysis of Holography; Introduction; Mathematical Ray-Tracing;  
 Numerical Example; Comparison of Paraxial Hologram and Lens Optics;  
 Three-Dimensional Ray-Tracing; Conclusions; References; Chapter 9:  
 Holographic Lenses and In-Line "Gabor" Holography; Introduction;  
 Transition to Wavefront Curvature; Phase Footprints, Again; In-Line  
 Interference, Again; Transmittance Proof of the Focus Equation; In-Line  
 (Gabor) Holograms; Conclusions; Chapter 10: Off-Axis "Leith &  
 Upatnieks" Holography; Introduction  
 Implications of Off-Axis Holography Interference and Diffraction in Off-  
 Axis Holograms; Models for Off-Axis Holograms; Image Magnification;  
 Intermodulation Noise; Conclusions; References; Chapter 11: Non-  
 Laser Illumination of Holograms; Introduction; Problems with Laser  
 Illumination; Sources of Image Blur; Narrow-Band Illumination; Point-  
 Source White Illumination; Image Depth Effects; Other Approaches;  
 Conclusions; References; Chapter 12: Phase Conjugation and Real  
 Image Projection; Real Image Projection Techniques; Phase  
 Conjugation- a Descriptive Approach  
 Perfect Conjugate Illumination (Examples)

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## Sommario/riassunto

The only all-inclusive treatment of holography-from fundamental  
 principles to the most advanced concepts While several existing texts  
 cover different aspects of the field of holography, none provides a  
 complete, up-to-date, and accessible view of its popular, scientific, and  
 engineering aspects. Now, from an author team that includes one of  
 the world's pioneers in the field, Holographic Imaging fills this need  
 with a single, comprehensive text that covers the subject from  
 traditional holography to the cutting-edge development of the world's  
 most advanced three-dimensional holographic images,

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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Preface -- Contributors -- Part One Gene Expression Analysis and Systems Biology -- 1. Hybrid of Neural Classifier and Swarm Intelligence in Multiclass Cancer Diagnosis with Gene Expression Signatures (Rui Xu, Georgios C. Anagnostopoulos, and Donald C. Wunsch II) -- 1.1 Introduction -- 1.2 Methods and Systems -- 1.3 Experimental Results -- 1.4 Conclusions -- 2. Classifying Gene Expression Profiles with Evolutionary Computation (Jin-Hyuk Hong and Sung-Bae Cho) -- 2.1 DNA Microarray Data Classification -- 2.2 Evolutionary Approach to the Problem -- 2.3 Gene Selection with Speciated Genetic Algorithm -- 2.4 Cancer Classification Based on Ensemble Genetic Programming -- 2.5 Conclusion -- 3. Finding Clusters in Gene Expression Data Using EvoCluster (Patrick C. H. Ma,

Keith C. C. Chan, and Xin Yao) -- 3.1 Introduction -- 3.2 Related Work -- 3.3 Evolutionary Clustering Algorithm -- 3.4 Experimental Results -- 3.5 Conclusions -- 4. Gene Networks and Evolutionary Computation (Jennifer Hallinan) -- 4.1 Introduction -- 4.2 Evolutionary Optimization -- 4.3 Computational Network Modeling -- 4.4 Extending Reach of Gene Networks -- 4.5 Network Topology Analysis -- 4.6 Summary -- Part Two Sequence Analysis and Feature Detection -- 5. Fuzzy-Granular Methods for Identifying Marker Genes from Microarray Expression Data (Yuanchen He, Yuchun Tang, Yan-Qing Zhang, and Rajshekhar Sunderraman) -- 5.1 Introduction -- 5.2 Traditional Algorithms for Gene Selection -- 5.3 New Fuzzy-Granular-Based Algorithm for Gene Selection -- 5.4 Simulation -- 5.5 Conclusions -- 6. Evolutionary Feature Selection for Bioinformatics (Laetitia Jourdan, Clarisse Dhaenens, and El-Ghazali Talbi) -- 6.1 Introduction -- 6.2 Evolutionary Algorithms for Feature Selection -- 6.3 Feature Selection for Clustering in Bioinformatics -- 6.4 Feature Selection for Classification in Bioinformatics -- 6.5 Frameworks and Data Sets -- 6.6 Conclusion -- 7. Fuzzy Approaches for the Analysis CpG Island Methylation Patterns (Ozy Sjahputera, Mihail Popescu, James M. Keller, and Charles W. Caldwell). 7.1 Introduction -- 7.2 Methods -- 7.3 Biological Significance -- 7.4 Conclusions -- Part Three Molecular Structure and Phylogenetics -- 8. Protein-Ligand Docking with Evolutionary Algorithms (Rene Thomsen) -- 8.1 Introduction -- 8.2 Biochemical Background -- 8.3 The Docking Problem -- 8.4 Protein-Ligand Docking Algorithms -- 8.5 Evolutionary Algorithms -- 8.6 Effect of Variation Operators -- 8.7 Differential Evolution -- 8.8 Evaluating Docking Methods -- 8.9 Comparison between Docking Methods -- 8.10 Summary -- 8.11 Future Research Topics -- 9. RNA Secondary Structure Prediction Employing Evolutionary Algorithms (Kay C. Wiese, Alain A. Deschanes, and Andrew G. Hendriks) -- 9.1 Introduction -- 9.2 Thermodynamic Models -- 9.3 Methods -- 9.4 Results -- 9.5 Conclusion -- 10. Machine Learning Approach for Prediction of Human Mitochondrial Proteins (Zhong Huang, Xuheng Xu, and Xiaohua Hu) -- 10.1 Introduction -- 10.2 Methods and Systems -- 10.3 Results and Discussion -- 10.4 Conclusions -- 11. Phylogenetic Inference Using Evolutionary Algorithms (Clare Bates Congdon) -- 11.1 Introduction -- 11.2 Background in Phylogenetics -- 11.3 Challenges and Opportunities for Evolutionary Computation -- 11.4 One Contribution of Evolutionary Computation: Graphyl -- 11.5 Some Other Contributions of Evolutionary computation -- 11.6 Open Questions and Opportunities -- Part Four Medicine -- 12. Evolutionary Algorithms for Cancer Chemotherapy Optimization (John McCall, Andrei Petrovski, and Siddhartha Shakya) -- 12.1 Introduction -- 12.2 Nature of Cancer -- 12.3 Nature of Chemotherapy -- 12.4 Models of Tumor Growth and Response -- 12.5 Constraints on Chemotherapy -- 12.6 Optimal Control Formulations of Cancer Chemotherapy -- 12.7 Evolutionary Algorithms for Cancer Chemotherapy Optimization -- 12.8 Encoding and Evaluation -- 12.9 Applications of EAs to Chemotherapy Optimization Problems -- 12.10 Related Work -- 12.11 Oncology Workbench -- 12.12 Conclusion -- 13. Fuzzy Ontology-Based Text Mining System for Knowledge Acquisition, Ontology Enhancement, and Query Answering from Biomedical Texts (Lipika Dey and Muhammad Abulaish). 13.1 Introduction -- 13.2 Brief Introduction to Ontologies -- 13.3 Information Retrieval from Biological Text Documents: Related Work -- 13.4 Ontology-Based IE and Knowledge Enhancement System -- 13.5 Document Processor -- 13.6 Biological Relation Extractor -- 13.7

Relation-Based Query Answering -- 13.8 Evaluation of the Biological  
Relation Extraction Process -- 13.9 Biological Relation Characterizer --  
13.10 Determining Strengths of Generic Biological Relations -- 13.11  
Enhancing GENIA to Fuzzy Relational Ontology -- 13.12 Conclusions  
and Future Work -- References -- Appendix Feasible Biological  
Relations -- Index.

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## Sommario/riassunto

Combining biology, computer science, mathematics, and statistics, the field of bioinformatics has become a hot new discipline with profound impacts on all aspects of biology and industrial application. Now, Computational Intelligence in Bioinformatics offers an introduction to the topic, covering the most relevant and popular CI methods, while also encouraging the implementation of these methods to readers' research.

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