

FUNDAMENTAL CONCEPTS OF BIOINFORMATICS

A VOYAGE THROUGH THE WONDERS OF BIOINFORMATICS: DISCOVER "FUNDAMENTAL CONCEPTS OF BIOINFORMATICS"

PREPARE TO EMBARK ON A TRULY REMARKABLE JOURNEY, ONE THAT WILL IGNITE YOUR CURIOSITY AND LEAVE YOU WITH A PROFOUND APPRECIATION FOR THE INTRICATE TAPESTRY OF LIFE. "FUNDAMENTAL CONCEPTS OF BIOINFORMATICS," WHILE ITS TITLE MIGHT SUGGEST A PURELY ACADEMIC ENDEAVOR, IS ANYTHING BUT. IT'S A BREATHTAKING EXPLORATION, A PORTAL TO A WORLD WHERE DATA WHISPERS THE SECRETS OF EXISTENCE, AND IT'S AN EXPERIENCE I WHOLEHEARTEDLY ENCOURAGE EVERY BOOK CLUB, YOUNG ADULT, AND GENERAL READER TO DISCOVER.

WHAT TRULY SETS THIS BOOK APART IS ITS UTTERLY IMAGINATIVE SETTING. THE AUTHORS HAVE MASTERFULLY CRAFTED A NARRATIVE THAT TRANSFORMS COMPLEX BIOLOGICAL DATA INTO A VIBRANT, LIVING LANDSCAPE. YOU'LL FIND YOURSELF NOT JUST READING ABOUT ALGORITHMS AND SEQUENCES, BUT WITNESSING THEM DANCE, EVOLVE, AND INTERTWINE IN WAYS THAT ARE BOTH SCIENTIFICALLY RIGOROUS AND WONDERFULLY POETIC. IT'S AS IF THE VERY CODE OF LIFE HAS BEEN RENDERED INTO A BREATHTAKING PANORAMA, INVITING YOU TO EXPLORE ITS EVERY NOOK AND CRANNY.

BEYOND THE CAPTIVATING SETTING, "FUNDAMENTAL CONCEPTS OF BIOINFORMATICS" DELVES INTO SURPRISING EMOTIONAL DEPTH. AS YOU UNRAVEL THE FUNDAMENTAL CONCEPTS, YOU'LL CONNECT WITH THE SHEER WONDER OF BIOLOGICAL DISCOVERY. THE AUTHORS HAVE A GIFT FOR HIGHLIGHTING THE UNIVERSAL HUMAN DESIRE TO

UNDERSTAND OURSELVES AND OUR PLACE IN THE UNIVERSE, AND THIS BOOK TAPS DIRECTLY INTO THAT FUNDAMENTAL LONGING. YOU'LL FIND YOURSELF ROOTING FOR BREAKTHROUGHS, MARVELING AT RESILIENCE, AND PERHAPS EVEN SHEDDING A TEAR AT THE ELEGANT SOLUTIONS NATURE HAS DEvised.

THE APPEAL OF THIS BOOK IS UNDENIABLY UNIVERSAL, TRANSCENDING AGE AND BACKGROUND. YOUNG ADULTS WILL FIND THEMSELVES EMPOWERED BY THE CLARITY AND ENGAGING PRESENTATION OF COMPLEX IDEAS, PERHAPS EVEN SPARKING A PASSION FOR FUTURE SCIENTIFIC PURSUITS. GENERAL READERS WILL BE DELIGHTED BY HOW ACCESSIBLE AND EXCITING THE WORLD OF BIOINFORMATICS CAN BE, SHATTERING ANY PRECONCEIVED NOTIONS OF DRY TECHNICALITY. FOR BOOK CLUBS, THIS OFFERS AN UNPARALLELED OPPORTUNITY FOR RICH DISCUSSION, WITH ITS BLEND OF SCIENTIFIC INTRIGUE, ETHICAL CONSIDERATIONS, AND DEEPLY HUMAN THEMES.

HERE ARE JUST A FEW OF THE STRENGTHS THAT MAKE THIS BOOK A MUST-READ:

ENCHANTING PROSE: THE AUTHORS POSSESS A RARE TALENT FOR WEAVING SCIENTIFIC ACCURACY WITH CAPTIVATING STORYTELLING.

VISUAL SPECTACLE: THE DESCRIPTIONS CREATE VIVID MENTAL IMAGERY, MAKING ABSTRACT CONCEPTS TANGIBLE AND EXCITING.

INTELLECTUAL STIMULATION: YOU'LL EMERGE WITH A NEWFOUND UNDERSTANDING OF THE BUILDING BLOCKS OF LIFE AND THE TOOLS USED TO DECIPHER THEM.

EMOTIONAL RESONANCE: THE BOOK TAPS INTO THE INHERENT WONDER AND AWE ASSOCIATED WITH BIOLOGICAL DISCOVERY.

ACCESSIBILITY FOR ALL: COMPLEX TOPICS ARE PRESENTED WITH REMARKABLE CLARITY, MAKING IT ENJOYABLE FOR BOTH NOVICES AND THOSE WITH PRIOR KNOWLEDGE.

"FUNDAMENTAL CONCEPTS OF BIOINFORMATICS" IS NOT JUST A BOOK; IT'S A GATEWAY. IT'S A TESTAMENT TO THE BEAUTY AND COMPLEXITY OF LIFE, PRESENTED IN A WAY THAT IS BOTH INFORMATIVE AND DEEPLY INSPIRING. IT'S A TIMELESS CLASSIC THAT CONTINUES TO CAPTURE HEARTS WORLDWIDE BECAUSE IT SPEAKS TO OUR FUNDAMENTAL HUMAN DRIVE TO UNDERSTAND. I CANNOT RECOMMEND THIS BOOK HIGHLY ENOUGH. DIVE IN AND PREPARE TO BE AMAZED. YOUR PERCEPTION OF THE WORLD, AND YOUR PLACE WITHIN IT, WILL

UNDOUBTEDLY BE ENRICHED.

THIS BOOK IS A TIMELESS CLASSIC, A TRUE MASTERPIECE THAT DESERVES A PROMINENT PLACE ON EVERY BOOKSHELF. ITS ENDURING IMPACT LIES IN ITS ABILITY TO NOT ONLY EDUCATE BUT TO TRULY INSPIRE.

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CONCEPTS IN BIOINFORMATICS AND GENOMICS
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CONCEPTS IN BIOINFORMATICS: FROM BASICS TO
ADVANCED
BIOINFORMATICS: CONCEPTS, METHODOLOGIES, TOOLS, AND APPLICATIONS
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FUNDAMENTALS OF
BIOINFORMATICS AND COMPUTATIONAL BIOLOGY
DRUG REPOSITIONING
AN INVESTIGATION OF MICRORNA TARGET
REGULATION MECHANISMS USING AN INTEGRATIVE APPROACH
WORKING WITH TEXT
DATA ANALYTICS AND
MANAGEMENT IN DATA INTENSIVE DOMAINS
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INFORMATION FLOWS EASILY FROM ONE TOPIC TO THE NEXT WITH ENOUGH DETAIL TO SUPPORT THE MAJOR
CONCEPTS WITHOUT OVERWHELMING STUDENTS BOOK JACKET

TAKES A CONCEPTUAL APPROACH TO ITS SUBJECT BALANCING BIOLOGY MATHEMATICS AND PROGRAMMING WHILE
HIGHLIGHTING RELEVANT REAL WORLD APPLICATIONS AND PROVIDING STUDENTS WITH THE TOOLS TO COMPUTE
AND ANALYZE BIOLOGICAL DATA

BIOINFORMATICS IS A SIGNIFICANT FIELD IN THE BIOLOGICAL SCIENCES THAT REQUIRES EXTENSIVE KNOWLEDGE
AND EXPERTISE IN BOTH STATISTICS AND COMPUTER SCIENCE THE INCREASING NUMBER OF NEW SEQUENCING
PROJECTS HAS MADE BIOINFORMATICS AN ESSENTIAL TOOL IN UNDERSTANDING BIOLOGICAL PROCESSES
PARTICULARLY IN THE AGRICULTURAL AND HEALTHCARE SECTORS WITH NUMEROUS APPLICATIONS THIS BOOK
CONCEPTS IN BIOINFORMATICS BASICS TO ADVANCES IS A COMPREHENSIVE RESOURCE FOR STUDENTS AND
RESEARCHERS PROVIDING A QUICK REFERENCE GUIDE TO THE SUBJECT IT COVERS A WIDE RANGE OF TOPICS
INCLUDING MOLECULAR DATA ANALYSIS MULTIPLE SEQUENCE ALIGNMENT PRIMER DESIGN PHYLOGENOMICS OMICS
MOLECULAR MODELING DRUG DESIGN AND SYNTHETIC BIOLOGY THE BOOK BEGINS BY INTRODUCING READERS TO
THE BASICS OF BIOINFORMATICS AND ITS HISTORY FOLLOWED BY A DISCUSSION OF IMPORTANT CONCEPTS SUCH
AS DATABASES SEQUENCE ALIGNMENT PRIMER DESIGN AND MOLECULAR PHYLOGENY THESE TOPICS ARE ESSENTIAL
FOR POSTGRADUATE STUDENTS IN BIOINFORMATICS BIOTECHNOLOGY AND MOLECULAR BIOLOGY LATER CHAPTERS
DELVE INTO MORE ADVANCED AREAS INCLUDING BLAST AND FASTA PROTEIN STRUCTURE PREDICTION THROUGH
HOMOLOGY MODELING AND MOLECULAR MODELING WHICH ARE CRUCIAL FOR IN SILICO ANALYSIS OVERALL THIS
BOOK IS A VALUABLE RESOURCE FOR ANYONE LOOKING TO GAIN A COMPREHENSIVE UNDERSTANDING OF
BIOINFORMATICS AND ITS APPLICATIONS

BIOINFORMATICS IS AN INTERDISCIPLINARY SCIENCE THAT DEVELOPS ON THE METHODS AND PRINCIPLES OF STATISTICS COMPUTING MATHEMATICS AND BIOLOGY TO ANALYZE BIOLOGICAL DATA IT ALSO INCLUDES THE STUDY OF PROTEIN STRUCTURES AMINO ACID SEQUENCES AND NUCLEOTIDE SEQUENCES TECHNIQUES SUCH AS MACHINE LEARNING ALGORITHMS PATTERN RECOGNITION DATA MINING AND VISUALIZATION ARE USED DRUG DISCOVERY AND DESIGN GENE FINDING SEQUENCE ALIGNMENT PROTEIN PROTEIN INTERACTIONS ETC ARE IMPORTANT AREAS OF INTEREST THIS BOOK AIMS TO SHED LIGHT ON SOME OF THE UNEXPLORED ASPECTS OF BIOINFORMATICS IT ELUCIDATES NEW TECHNIQUES AND THEIR APPLICATIONS IN A MULTIDISCIPLINARY APPROACH IN THIS BOOK CONSTANT EFFORT HAS BEEN MADE TO MAKE THE UNDERSTANDING OF THE DIFFICULT CONCEPTS OF BIOINFORMATICS AS EASY AND INFORMATIVE AS POSSIBLE FOR THE READERS

BIOINFORMATICS CONCEPTS METHODOLOGIES TOOLS AND APPLICATIONS HIGHLIGHTS THE AREA OF BIOINFORMATICS AND ITS IMPACT OVER THE MEDICAL COMMUNITY WITH ITS INNOVATIONS THAT CHANGE HOW WE RECOGNIZE AND CARE FOR ILLNESSES PROVIDED BY PUBLISHER

THE FIELD OF BIOINFORMATICS IS SIGNIFICANT FOR THE UNDERSTANDING OF BIOLOGICAL DATA THROUGH THE DEVELOPMENT OF METHODS AND SOFTWARE TOOLS IT AIDS IN THE SEQUENCING AND ANNOTATION OF GENOMES AND MUTATIONS DEVELOPMENT OF GENE ONTOLOGIES ANALYSIS OF GENE AND PROTEIN EXPRESSION AND REGULATION IT ALSO PLAYS A CRUCIAL ROLE IN CATALOGUING THE BIOLOGICAL PATHWAYS AND NETWORKS SIMULATION AND MODELING OF DNA RNA AND PROTEINS PATTERN RECOGNITION MACHINE LEARNING ALGORITHMS AND VISUALIZATION ARE COMMONLY APPLIED IN BIOINFORMATICS TO CONDUCT THESE STUDIES RESEARCH IN THIS FIELD FOCUSES IN THE AREAS OF GENE FINDING DRUG DESIGN DRUG DISCOVERY PROTEIN PROTEIN INTERACTIONS MODELING OF EVOLUTION ETC THIS BOOK UNFOLDS THE INNOVATIVE ASPECTS OF BIOINFORMATICS WHICH WILL BE CRUCIAL FOR THE PROGRESS OF THIS FIELD IN THE FUTURE IT ATTEMPTS TO UNDERSTAND THE MULTIPLE BRANCHES THAT FALL UNDER THIS DISCIPLINE AND HOW SUCH CONCEPTS HAVE PRACTICAL APPLICATIONS STUDENTS RESEARCHERS EXPERTS AND ALL ASSOCIATED WITH THIS FIELD WILL BENEFIT ALIKE FROM THIS BOOK

REVIEWS OF THE SECOND EDITION IN THIS BOOK ANDY BAXEVANIS AND FRANCIS OUELLETTE HAVE UNDERTAKEN

THE DIFFICULT TASK OF ORGANIZING THE KNOWLEDGE IN THIS FIELD IN A LOGICAL PROGRESSION AND PRESENTING IT IN A DIGESTIBLE FORM AND THEY HAVE DONE AN EXCELLENT JOB THIS FINE TEXT WILL MAKE A MAJOR IMPACT ON BIOLOGICAL RESEARCH AND IN TURN ON PROGRESS IN BIOMEDICINE WE ARE ALL IN THEIR DEBT ERIC LANDER FROM THE FOREWORD TO THE SECOND EDITION THE EDITORS AND THE CHAPTER AUTHORS OF THIS BOOK ARE TO BE APPLAUDED FOR PROVIDING BIOLOGISTS WITH LUCID AND COMPREHENSIVE DESCRIPTIONS OF ESSENTIAL TOPICS IN BIOINFORMATICS THIS BOOK IS EASY TO READ HIGHLY INFORMATIVE AND CERTAINLY TIMELY IT IS MOST HIGHLY RECOMMENDED FOR STUDENTS AND FOR ESTABLISHED INVESTIGATORS ALIKE FOR ANYONE WHO NEEDS TO KNOW HOW TO ACCESS AND USE THE INFORMATION DERIVED IN AND FROM GENOMIC SEQUENCING PROJECTS TRENDS IN GENETICS IT IS AN EXCELLENT GENERAL BIOINFORMATICS TEXT AND REFERENCE PERHAPS EVEN THE BEST CURRENTLY AVAILABLE CONGRATULATIONS TO THE AUTHORS EDITORS AND PUBLISHER FOR PRODUCING A WEIGHTY AUTHORITATIVE READABLE AND ATTRACTIVE BOOK BRIEFINGS IN BIOINFORMATICS THIS BOOK WRITTEN BY THE TOP SCIENTISTS IN THE FIELD OF BIOINFORMATICS IS THE PERFECT CHOICE FOR EVERY MOLECULAR BIOLOGY LABORATORY THE QUARTERLY REVIEW OF BIOLOGY THIS FULLY REVISED VERSION OF A WORLD RENOWNED BESTSELLER PROVIDES READERS WITH A PRACTICAL GUIDE COVERING THE FULL SCOPE OF KEY CONCEPTS IN BIOINFORMATICS FROM DATABASES TO PREDICTIVE AND COMPARATIVE ALGORITHMS USING RELEVANT BIOLOGICAL EXAMPLES THE BOOK PROVIDES BACKGROUND ON AND STRATEGIES FOR USING MANY OF THE MOST POWERFUL AND COMMONLY USED COMPUTATIONAL APPROACHES FOR BIOLOGICAL DISCOVERY THIS THIRD EDITION REINFORCES KEY CONCEPTS THAT HAVE STOOD THE TEST OF TIME WHILE MAKING THE READER AWARE OF NEW AND IMPORTANT DEVELOPMENTS IN THIS FAST MOVING FIELD WITH A NEW FULL COLOR AND ENLARGED PAGE DESIGN BIOINFORMATICS THIRD EDITION OFFERS THE MOST READABLE UP TO DATE AND THOROUGH INTRODUCTION TO THE FIELD FOR BIOLOGISTS THIS NEW EDITION FEATURES NEW CHAPTERS ON GENOMIC DATABASES PREDICTIVE METHODS USING RNA SEQUENCES SEQUENCE POLYMORPHISMS PROTEIN STRUCTURE PREDICTION INTERMOLECULAR INTERACTIONS AND PROTEOMIC APPROACHES FOR PROTEIN IDENTIFICATION DETAILED WORKED EXAMPLES ILLUSTRATING THE STRATEGIC USE OF THE CONCEPTS PRESENTED IN EACH CHAPTER ALONG WITH A COLLECTION OF EXPANDED MORE RIGOROUS PROBLEM SETS SUITABLE FOR

CLASSROOM USE SPECIAL TOPIC BOXES AND APPENDICES HIGHLIGHTING EXPERIMENTAL STRATEGIES AND ADVANCED CONCEPTS ANNOTATED REFERENCE LISTS COMPREHENSIVE LISTS OF RELEVANT RESOURCES AND AN EXTENSIVE GLOSSARY OF COMMONLY USED TERMS IN BIOINFORMATICS GENOMICS AND PROTEOMICS BIOINFORMATICS THIRD EDITION IS ESSENTIAL READING FOR RESEARCHERS INSTRUCTORS AND STUDENTS OF ALL LEVELS IN MOLECULAR BIOLOGY AND BIOINFORMATICS AS WELL AS FOR INVESTIGATORS INVOLVED IN GENOMICS CLINICAL RESEARCH PROTEOMICS AND COMPUTATIONAL BIOLOGY WILEY COM BIOINFORMATICS

BIOINFORMATICS IS AN EVOLVING FIELD THAT IS GAINING POPULARITY DUE TO GENOMICS PROTEOMICS AND OTHER HIGH THROUGHPUT BIOLOGICAL METHODS THE FUNCTION OF BIOINFORMATIC SCIENTISTS INCLUDES BIOLOGICAL DATA STORAGE RETRIEVAL AND IN SILICO ANALYSIS OF THE RESULTS FROM LARGE SCALE EXPERIMENTS THIS REQUIRES A GRASP OF KNOWLEDGE MINING ALGORITHMS A THOROUGH UNDERSTANDING OF BIOLOGICAL KNOWLEDGE BASE AND THE LOGICAL RELATIONSHIP OF ENTITIES THAT DESCRIBE A PROCESS OR THE SYSTEM BIOINFORMATICS RESEARCHERS ARE REQUIRED TO BE TRAINED IN MULTIDISCIPLINARY FIELDS OF BIOLOGY MATHEMATICS AND COMPUTER SCIENCE CURRENTLY THE REQUIREMENTS ARE SATISFIED BY AD HOC RESEARCHERS WHO HAVE SPECIFIC SKILLS IN BIOLOGY OR MATHEMATICS COMPUTER SCIENCE BUT THE LEARNING CURVE IS STEEP AND THE TIME REQUIRED TO COMMUNICATE USING DOMAIN SPECIFIC TERMS IS BECOMING A MAJOR BOTTLE NECK IN SCIENTIFIC PRODUCTIVITY THIS WORKBOOK PROVIDES HANDS ON EXPERIENCE WHICH HAS BEEN LACKING FOR QUALIFIED BIOINFORMATICS RESEARCHERS

IN THIS BOOK ANDY BAXEVANIS AND FRANCIS OUELLETTE HAVE UNDERTAKEN THE DIFFICULT TASK OF ORGANIZING THE KNOWLEDGE IN THIS FIELD IN A LOGICAL PROGRESSION AND PRESENTING IT IN A DIGESTIBLE FORM AND THEY HAVE DONE AN EXCELLENT JOB THIS FINE TEXT WILL MAKE A MAJOR IMPACT ON BIOLOGICAL RESEARCH AND IN TURN ON PROGRESS IN BIOMEDICINE WE ARE ALL IN THEIR DEBT ERIC LANDER FROM THE FOREWORD REVIEWS FROM THE FIRST EDITION PROVIDES A BROAD OVERVIEW OF THE BASIC TOOLS FOR SEQUENCE ANALYSIS FOR BIOLOGISTS APPROACHING THIS SUBJECT FOR THE FIRST TIME IT WILL BE A VERY USEFUL HANDBOOK TO KEEP ON THE SHELF AFTER THE FIRST READING CLOSE TO THE COMPUTER NATURE STRUCTURAL BIOLOGY SHOULD BE IN

THE PERSONAL LIBRARY OF ANY BIOLOGIST WHO USES THE INTERNET FOR THE ANALYSIS OF DNA AND PROTEIN SEQUENCE DATA. SCIENCE A WONDERFUL PRIMER DESIGNED TO NAVIGATE THE NOVICE THROUGH THE INTRICACIES OF IN SCRIPTO ANALYSIS. THE ACCOMPLISHED GENESEARCHER WILL ALSO FIND THIS BOOK A USEFUL ADDITION TO THEIR LIBRARY. AN EXCELLENT REFERENCE TO THE PRINCIPLES OF BIOINFORMATICS. TRENDS IN BIOCHEMICAL SCIENCES. THIS NEW EDITION OF THE HIGHLY SUCCESSFUL BIOINFORMATICS: A PRACTICAL GUIDE TO THE ANALYSIS OF GENES AND PROTEINS PROVIDES A SOUND FOUNDATION OF BASIC CONCEPTS WITH PRACTICAL DISCUSSIONS AND COMPARISONS OF BOTH COMPUTATIONAL TOOLS AND DATABASES RELEVANT TO BIOLOGICAL RESEARCH. EQUIPPING BIOLOGISTS WITH THE MODERN TOOLS NECESSARY TO SOLVE PRACTICAL PROBLEMS IN SEQUENCE DATA ANALYSIS. THE SECOND EDITION COVERS THE BROAD SPECTRUM OF TOPICS IN BIOINFORMATICS RANGING FROM INTERNET CONCEPTS TO PREDICTIVE ALGORITHMS USED ON SEQUENCE STRUCTURE AND EXPRESSION DATA. WITH CHAPTERS WRITTEN BY EXPERTS IN THE FIELD, THIS UP-TO-DATE REFERENCE THOROUGHLY COVERS VITAL CONCEPTS AND IS APPROPRIATE FOR BOTH THE NOVICE AND THE EXPERIENCED PRACTITIONER. WRITTEN IN CLEAR, SIMPLE LANGUAGE, THE BOOK IS ACCESSIBLE TO USERS WITHOUT AN ADVANCED MATHEMATICAL OR COMPUTER SCIENCE BACKGROUND. THIS NEW EDITION INCLUDES ALL NEW END-OF-CHAPTER RESOURCES, BIBLIOGRAPHIES, AND PROBLEM SETS. ACCOMPANYING SITE CONTAINING THE ANSWERS TO THE PROBLEMS AS WELL AS LINKS TO RELEVANT RESOURCES. NEW COVERAGE OF COMPARATIVE GENOMICS, LARGE SCALE GENOME ANALYSIS, SEQUENCE ASSEMBLY, AND EXPRESSED SEQUENCE TAGS. A GLOSSARY OF COMMONLY USED TERMS IN BIOINFORMATICS AND GENOMICS. BIOINFORMATICS: A PRACTICAL GUIDE TO THE ANALYSIS OF GENES AND PROTEINS, SECOND EDITION IS ESSENTIAL READING FOR RESEARCHERS, INSTRUCTORS, AND STUDENTS OF ALL LEVELS IN MOLECULAR BIOLOGY AND BIOINFORMATICS, AS WELL AS FOR INVESTIGATORS INVOLVED IN GENOMICS, POSITIONAL CLONING, CLINICAL RESEARCH, AND COMPUTATIONAL BIOLOGY.

AS MORE SPECIES GENOMES ARE SEQUENCED, COMPUTATIONAL ANALYSIS OF THESE DATA HAS BECOME INCREASINGLY IMPORTANT. THE SECOND, ENTIRELY UPDATED EDITION OF THIS WIDELY PRAISED TEXTBOOK PROVIDES A COMPREHENSIVE AND CRITICAL EXAMINATION OF THE COMPUTATIONAL METHODS NEEDED FOR ANALYZING DNA, RNA, AND PROTEIN DATA, AS WELL AS GENOMES. THE BOOK HAS BEEN REWRITTEN TO MAKE IT

MORE ACCESSIBLE TO A WIDER AUDIENCE INCLUDING ADVANCED UNDERGRADUATE AND GRADUATE STUDENTS NEW FEATURES INCLUDE CHAPTER GUIDES AND EXPLANATORY INFORMATION PANELS AND GLOSSARY TERMS NEW CHAPTERS IN THIS SECOND EDITION COVER STATISTICAL ANALYSIS OF SEQUENCE ALIGNMENTS COMPUTER PROGRAMMING FOR BIOINFORMATICS AND DATA MANAGEMENT AND MINING PRACTICALLY ORIENTED PROBLEMS AT THE ENDS OF CHAPTERS ENHANCE THE VALUE OF THE BOOK AS A TEACHING RESOURCE THE BOOK ALSO SERVES AS AN ESSENTIAL REFERENCE FOR PROFESSIONALS IN MOLECULAR BIOLOGY PHARMACEUTICAL AND GENOME LABORATORIES

THIS BOOK OFFERS COMPREHENSIVE COVERAGE OF ALL THE CORE TOPICS OF BIOINFORMATICS AND INCLUDES PRACTICAL EXAMPLES COMPLETED USING THE MATLAB BIOINFORMATICS TOOLBOX™ IT IS PRIMARILY INTENDED AS A TEXTBOOK FOR ENGINEERING AND COMPUTER SCIENCE STUDENTS ATTENDING ADVANCED UNDERGRADUATE AND GRADUATE COURSES IN BIOINFORMATICS AND COMPUTATIONAL BIOLOGY THE BOOK DEVELOPS BIOINFORMATICS CONCEPTS FROM THE GROUND UP STARTING WITH AN INTRODUCTORY CHAPTER ON MOLECULAR BIOLOGY AND GENETICS THIS CHAPTER WILL ENABLE PHYSICAL SCIENCE STUDENTS TO FULLY UNDERSTAND AND APPRECIATE THE ULTIMATE GOALS OF APPLYING THE PRINCIPLES OF INFORMATION TECHNOLOGY TO CHALLENGES IN BIOLOGICAL DATA MANAGEMENT SEQUENCE ANALYSIS AND SYSTEMS BIOLOGY THE FIRST PART OF THE BOOK ALSO INCLUDES A SURVEY OF EXISTING BIOLOGICAL DATABASES TOOLS THAT HAVE BECOME ESSENTIAL IN TODAY'S BIOTECHNOLOGY RESEARCH THE SECOND PART OF THE BOOK COVERS METHODOLOGIES FOR RETRIEVING BIOLOGICAL INFORMATION INCLUDING FUNDAMENTAL ALGORITHMS FOR SEQUENCE COMPARISON SCORING AND DETERMINING EVOLUTIONARY DISTANCE THE MAIN FOCUS OF THE THIRD PART IS ON MODELING BIOLOGICAL SEQUENCES AND PATTERNS AS MARKOV CHAINS IT PRESENTS KEY PRINCIPLES FOR ANALYZING AND SEARCHING FOR SEQUENCES OF SIGNIFICANT MOTIFS AND BIOMARKERS THE LAST PART OF THE BOOK DEDICATED TO SYSTEMS BIOLOGY COVERS PHYLOGENETIC ANALYSIS AND EVOLUTIONARY TREE COMPUTATIONS AS WELL AS GENE EXPRESSION ANALYSIS WITH MICROARRAYS IN BRIEF THE BOOK OFFERS THE IDEAL HANDS ON REFERENCE GUIDE TO THE FIELD OF BIOINFORMATICS AND COMPUTATIONAL BIOLOGY

THE HOW S AND WHY S OF SUCCESSFUL DRUG REPOSITIONING DRUG REPOSITIONING ALSO KNOWN AS DRUG REPROFILING OR REPURPOSING HAS BECOME AN INCREASINGLY IMPORTANT PART OF THE DRUG DEVELOPMENT PROCESS THIS BOOK EXAMINES THE BUSINESS TECHNICAL SCIENTIFIC AND OPERATIONAL CHALLENGES AND OPPORTUNITIES THAT DRUG REPOSITIONING OFFERS READERS WILL LEARN HOW TO PERFORM THE LATEST EXPERIMENTAL AND COMPUTATIONAL METHODS THAT SUPPORT DRUG REPOSITIONING AND DETAILED CASE STUDIES THROUGHOUT THE BOOK DEMONSTRATE HOW THESE METHODS FIT WITHIN THE CONTEXT OF A COMPREHENSIVE DRUG REPOSITIONING STRATEGY DRUG REPOSITIONING IS DIVIDED INTO THREE PARTS PART 1 DRUG REPOSITIONING BUSINESS CASE STRATEGIES AND OPERATIONAL CONSIDERATIONS EXAMINES THE MEDICAL AND COMMERCIAL DRIVERS UNDERPINNING THE QUEST TO REPOSITION EXISTING DRUGS GUIDING READERS THROUGH THE KEY STRATEGIC TECHNICAL OPERATIONAL AND REGULATORY DECISIONS NEEDED FOR SUCCESSFUL DRUG REPOSITIONING PROGRAMS PART 2 APPLICATION OF TECHNOLOGY PLATFORMS TO UNCOVER NEW INDICATIONS AND REPURPOSE EXISTING DRUGS SETS FORTH COMPUTATIONAL BASED STRATEGIES TOOLS AND DATABASES THAT HAVE BEEN DESIGNED FOR REPOSITIONING STUDIES SCREENING APPROACHES INCLUDING COMBINATIONS OF EXISTING DRUGS AND A LOOK AT THE DEVELOPMENT OF CHEMICALLY MODIFIED ANALOGS OF APPROVED AGENTS PART 3 ACADEMIC AND NON PROFIT INITIATIVES THE ROLE OF ALLIANCES IN THE DRUG REPOSITIONING INDUSTRY EXPLORES CURRENT INVESTIGATIONS FOR REPOSITIONING DRUGS TO TREAT RARE AND NEGLECTED DISEASES WHICH ARE FREQUENTLY OVERLOOKED BY FOR PROFIT PHARMACEUTICAL COMPANIES DUE TO THEIR LACK OF COMMERCIAL RETURN THE BOOK S APPENDIX PROVIDES VALUABLE RESOURCES FOR DRUG REPOSITIONING RESEARCHERS INCLUDING INFORMATION ON DRUG REPOSITIONING AND REFORMULATION COMPANIES DATABASES GOVERNMENT RESOURCES AND ORGANIZATIONS REGULATORY AGENCIES AND DRUG REPOSITIONING INITIATIVES FROM ACADEMIA AND NON PROFITS WITH THIS BOOK AS THEIR GUIDE STUDENTS AND PHARMACEUTICAL RESEARCHERS CAN LEARN HOW TO USE DRUG REPOSITIONING TECHNIQUES TO EXTEND THE LIFESPAN AND APPLICATIONS OF EXISTING DRUGS AS WELL AS MAXIMIZE THE RETURN ON INVESTMENT IN DRUG RESEARCH AND DEVELOPMENT

THIS WORK IS A SHOWCASE FOR THE INTEGRATION OF SYSTEMS BIOLOGY AND BIOINFORMATICS TOOLS ALGORITHMS AND MODELS FOR DECIPHERING BIOLOGICAL PHENOMENA MORE SPECIFICALLY IT INTEGRATES I

PREDICTION ALGORITHMS FOR IDENTIFYING AND CHARACTERIZING MOLECULAR INTERACTIONS II STRUCTURAL MODELLING OF MOLECULE COMPLEXES III NETWORK ANALYSIS APPROACHES AND IV MATHEMATICAL MODELLING AND SIMULATION TWO COMPREHENSIVE WORKFLOWS ARE IMPLEMENTED FOR THE ANALYSIS OF COLLECTIVE TARGET GENE REGULATION BY MICRORNAS AND FOR THE PREDICTION OF COOPERATING MICRORNA PAIRS AND THEIR MUTUAL TARGET GENES IN TWO CASE STUDIES MECHANISMS OF FINE TUNED TARGET GENE REGULATION ARE REVEALED FOR DIFFERENT CELLULAR PROCESSES AND THE PHENOMENON OF COOPERATIVE TARGET REGULATION IS IDENTIFIED AS FREQUENT MECHANISM OF GENE REGULATION IN HUMANS

WHAT IS TEXT MINING AND HOW CAN IT BE USED WHAT RELEVANCE DO THESE METHODS HAVE TO EVERYDAY WORK IN INFORMATION SCIENCE AND THE DIGITAL HUMANITIES HOW DOES ONE DEVELOP COMPETENCES IN TEXT MINING WORKING WITH TEXT PROVIDES A SERIES OF CROSS DISCIPLINARY PERSPECTIVES ON TEXT MINING AND ITS APPLICATIONS AS TEXT MINING RAISES LEGAL AND ETHICAL ISSUES THE LEGAL BACKGROUND OF TEXT MINING AND THE RESPONSIBILITIES OF THE ENGINEER ARE DISCUSSED IN THIS BOOK CHAPTERS PROVIDE AN INTRODUCTION TO THE USE OF THE POPULAR GATE TEXT MINING PACKAGE WITH DATA DRAWN FROM SOCIAL MEDIA THE USE OF TEXT MINING TO SUPPORT SEMANTIC SEARCH THE DEVELOPMENT OF AN AUTHORITY SYSTEM TO SUPPORT CONTENT TAGGING AND RECENT TECHNIQUES IN AUTOMATIC LANGUAGE EVALUATION FOCUSED STUDIES DESCRIBE TEXT MINING ON HISTORICAL TEXTS AUTOMATED INDEXING USING CONSTRAINED VOCABULARIES AND THE USE OF NATURAL LANGUAGE PROCESSING TO EXPLORE THE CLIMATE SCIENCE LITERATURE INTERVIEWS ARE INCLUDED THAT OFFER A GLIMPSE INTO THE REAL LIFE EXPERIENCE OF WORKING WITHIN COMMERCIAL AND ACADEMIC TEXT MINING INTRODUCES TEXT ANALYSIS AND TEXT MINING TOOLS PROVIDES A COMPREHENSIVE OVERVIEW OF COSTS AND BENEFITS INTRODUCES THE TOPIC MAKING IT ACCESSIBLE TO A GENERAL AUDIENCE IN A VARIETY OF FIELDS INCLUDING EXAMPLES FROM BIOLOGY CHEMISTRY SOCIOLOGY AND CRIMINOLOGY

THIS BOOK CONSTITUTES THE REFEREED PROCEEDINGS OF THE 28TH INTERNATIONAL CONFERENCE ON DATA ANALYTICS AND MANAGEMENT IN DATA INTENSIVE DOMAINS DAMDID RCDL 2016 HELD IN ERSHOVO MOSCOW RUSSIA IN OCTOBER 2016 THE 16 REVISED FULL PAPERS PRESENTED TOGETHER WITH ONE INVITED TALK AND

TWO KEYNOTE PAPERS WERE CAREFULLY REVIEWED AND SELECTED FROM 57 SUBMISSIONS THE PAPERS ARE ORGANIZED IN TOPICAL SECTIONS ON SEMANTIC MODELING IN DATA INTENSIVE DOMAINS KNOWLEDGE AND LEARNING MANAGEMENT TEXT MINING DATA INFRASTRUCTURES IN ASTROPHYSICS DATA ANALYSIS RESEARCH INFRASTRUCTURES POSITION PAPER

THANK YOU FOR READING
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