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Systems Biology and the Challenge of Deciphering the Metabolic Mechanisms Underlying Cancer Springer

Many prominent Christians insist that the church must yield to contemporary evolutionary theory and therefore modify traditional biblical ideas about the creation of life. They argue that God used—albeit in an undetectable way—evolutionary mechanisms to produce all forms of life. Featuring two dozen highly credentialed scientists, philosophers, and theologians from Europe and North America, this volume contests this proposal, documenting evidential, logical, and theological problems with theistic evolution—making it the most comprehensive critique of theistic evolution yet produced.

Design, Analysis and Presentation in Practical Work Springer Nature

This book compiles leading research on the development of explainable and interpretable machine learning methods in the context of computer vision and machine learning. Research progress in computer vision and pattern recognition has led to a variety of modeling techniques with almost human-like performance. Although these models have obtained astounding results, they are limited in their explainability and interpretability: what is the rationale behind the decision made? what in the model structure explains its functioning? Hence, while good performance is a critical required characteristic for learning machines, explainability and interpretability capabilities are needed to take learning machines to the next step to include them in decision support systems involving human supervision. This book, written by leading international researchers, addresses key topics of explainability and interpretability, including the following: · Evaluation and Generalization in Interpretable Machine Learning · Explanation Methods in Deep Learning · Learning Functional Causal Models with Generative Neural Networks · Learning Interpreatable Rules for Multi-Label Classification · Structuring Neural Networks for More Explainable Predictions · Generating Post Hoc Rationales of Deep Visual Classification Decisions · Ensembling Visual Explanations · Explainable Deep Driving by Visualizing Causal Attention · Interdisciplinary Perspective on Algorithmic Job Candidate Search · Multimodal Personality Trait Analysis for Explainable Modeling of Job Interview Decisions · Inherent Explainability Pattern Theory-based Video Event Interpretations

Multi-omic Data Integration John Wiley & Sons

These proceedings represent the work of contributors to the 16th International Conference on Cyber Warfare and Security (ICCWS 2021), hosted by joint collaboration of Tennessee Tech Cybersecurity Education, Research and Outreach Center (CEROC), Computer Science department and the Oak Ridge National Laboratory, Tennessee on 25-26 February 2021. The Conference Co-Chairs are Dr. Juan Lopez Jr, Oak Ridge National Laboratory, Tennessee, and Dr. Ambareen Siraj, Tennessee Tech's Cybersecurity Education, Research and Outreach Center (CEROC), and the Program Chair is Dr. Kalyan Perumalla, from Oak Ridge National Laboratory, Tennessee.

Protein Moonlighting in Biology and Medicine John Wiley & Sons

Essential Cell Biology provides a readily accessible introduction to the central concepts of cell biology, and its lively, clear writing and exceptional illustrations make it the ideal textbook for a first course in both cell and molecular biology. The text and figures are easy-to-follow, accurate, clear, and engaging for the introductory student. Molecular detail has been kept to a minimum in order to provide the reader with a cohesive conceptual framework for the basic science that underlies our current understanding of all of biology, including the biomedical sciences. The Fourth Edition has been thoroughly revised, and covers the latest developments in this fast-moving field, yet retains the academic level and length of the previous edition. The book is accompanied by a rich package of online student and instructor resources, including over 130 narrated movies, an expanded and updated Question Bank. Essential Cell Biology, Fourth Edition is additionally supported by the Garland Science Learning System. This homework platform is designed to evaluate and improve student performance and allows instructors to select assignments on specific topics and review the performance of the entire class, as well as individual students, via the instructor dashboard. Students receive immediate feedback on their mastery of the topics, and will be better prepared for lectures and classroom discussions. The user-friendly system provides a convenient way to engage students while assessing progress. Performance data can be used to tailor classroom discussion, activities, and lectures to address students' needs precisely and efficiently. For more information and sample material, visit http://garlandscience.rocketmix.com/.

Key Skills for Practical Assessments and Project Work CRC Press

Stable, predictive biomarkers and interpretable disease signatures are seen as a significant step towards personalized medicine. In this perspective, integration of multi-omic data coming from genomics, transcriptomics, glycomics, proteomics, metabolomics is a powerful strategy to reconstruct

and analyse complex multi-dimensional interactions, enabling deeper mechanistic and medical insight. At the same time, there is a rising concern that much of such different omic data –although often publicly and freely available- lie in databases and repositories underutilised or not used at all. Issues coming from lack of standardisation and shared biological identities are also well-known. From these considerations, a novel, pressing request arises from the life sciences to design methodologies and approaches that allow for these data to be interpreted as a whole, i.e. as intertwined molecular signatures containing genes, proteins, mRNAs and miRNAs, able to capture inter-layers connections and complexity. Papers discuss data integration approaches and methods of several types and extents, their application in understanding the pathogenesis of specific diseases or in identifying candidate biomarkers to exploit the full benefit of multi-omic datasets and their intrinsic information content. Topics of interest include, but are not limited to: • Methods for the integration of layered data, including, but not limited to, genomics, transcriptomics, glycomics, proteomics, metabolomics; • Application of multi-omic data integration approaches for diagnostic biomarker discovery in any field of the life sciences; • Innovative approaches for the analysis and the visualization of multi-omic datasets; • Methods and applications for systematic measurements from single/undivided samples (comprising genomic, transcriptomic, proteomic, metabolomic measurements, among others); • Multi-scale approaches for integrated dynamic modelling and simulation; • Implementation of applications, computational resources and repositories devoted to data integration including, but not limited to, data warehousing, database federation, semantic integration, service-oriented and/or wiki integration; • Issues related to the definition and implementation of standards, shared identities and semantics, with particular focus on the integration problem. Research papers, reviews and short communications on all topics related to the above issues were welcomed.

Explainable and Interpretable Models in Computer Vision and Machine Learning Frontiers Media SA

This e-book brings together scholars in both the neurosciences and organizational sciences who have adopted various approaches to study the cognitive mechanisms mediating the social behavior that we see within organizations. Such an approach has been termed by ourselves, and others, as ‘organisational cognitive neuroscience’. In recent years there has been a veritable increase in studies that have explored the cognitive mechanisms driving such behaviors, and much progress has been made in understanding the neural underpinnings of processes such as financial exchange, risk awareness and even leadership. However, while these studies are informative and add to our understanding of human cognition they fall short of providing evidence-based recommendations for practice. Specifically, we address the broader issue of how the neuroscientific study of such core social behaviors can be used to improve the very way that we work. To address these gaps in our understanding the chapters in this book serve as a platform that allows scholars in both the neurosciences and the organizational sciences to highlight the work that spans across these two fields. The consolidation of these two fields also serves to highlight the utility of a singular organizational cognitive neuroscience. This is a fundamentally important outcome of the book as the application of neuroscience to address economically relevant behaviors has seen a variety of fields evolve in their own right, such as neuromarketing, neuroeconomics and so forth. The use of neuro-scientific technologies,in particular fMRI, has indeed led to a bewildering (and somewhat suffocating) proliferation of new approaches, however, the speed of such developments demands that we must proceed carefully with such ventures or risk some fundamental mistakes. The book that you now hold will consolidates these new neuroscience based approaches and in doing so highlight the importance of this approach in helping us to understand human social behavior in general. Taken together the chapters provide a framework for scholars within the neurosciences who wish to explore the further the opportunities that the study of organisational behavior may provide.

Systems Biology of Tumor Physiology Springer Nature

This book constitutes the refereed proceedings of the 11th International Colloquium on Theoretical Aspects of Computing, ICTAC 2014 held in Bucharest, Romania, in September 2014. The 25 revised full papers presented together with three invited talks were carefully reviewed and selected from 74 submissions. The papers cover various topics such as automata theory and formal languages; principles and semantics of programming languages; theories of concurrency, mobility and reconfiguration; logics and their applications; software architectures and their models, refinement and verification; relationship between software requirements, models and code; static and dynamic program analysis and verification; software specification, refinement, verification and testing; model checking and theorem proving; models of object and component systems; coordination and feature interaction; integration of theories, formal methods and tools for engineering computing systems; service-oriented architectures: models and development methods; models of concurrency, security, and mobility; theories of distributed, grid and cloud computing; real-time, embedded, hybrid and cyber-physical systems; type and category theory in computer science; models for e-learning and education; case studies, theories, tools and experiments of verified systems; domain-specific modeling and technology: examples, frameworks and practical experience; challenges and foundations in environmental modeling and monitoring, healthcare, and disaster management.

A Systems Biology Approach to Blood John Wiley & Sons

Winner of the IENE Project Award 2016. This authoritative volume brings together some of the world’s leading researchers, academics, practitioners and transportation agency personnel to present the current status of the ecological sustainability of the linear infrastructure – primarily road, rail and utility easements – that dissect and fragment landscapes globally. It outlines the potential impacts, demonstrates how this infrastructure is being improved, and how broad ecological principles are applied to mitigate the impact of road networks on wildlife. Research and monitoring is an important aspect of road ecology, encompassing all phases of a transportation project. This book covers research and monitoring to span the entire project continuum – starting with planning and design, through construction and into maintenance and management. It focuses on impacts and solutions for species groups and specific regions, with particular emphasis on the unique challenges facing Asia, South America and Africa. Other key features: Contributions from authors originating from over 25 countries, including from all continents Each chapter summarizes important lessons, and includes lists of further reading and thoroughly up to date references Highlights principles that address key points relevant to all phases in all road projects Explains best-practices based on a number of successful international case studies Chapters are "stand-alone", but they also build upon and complement each other; extensive cross-referencing directs the reader to relevant material elsewhere in the book Handbook of Road Ecology offers a comprehensive summary of approximately 30 years of global efforts to quantify the impacts of roads and traffic and implement effective mitigation. As such, it is essential reading for those involved in the planning, design, assessment and construction of new roads; the management and maintenance of existing roads; and the modifying or retrofitting of existing roads and problem locations. This handbook is an accessible resource for both developed and developing countries, including government transportation agencies, Government environmental/conservation agencies, NGOs, and road funding and donor organisations.

Design and Analysis of Experiments and Regression CRC Press

The blood system is multi-scale, from the organism to the organs to cells to intracellular signaling pathways to macromolecule interactions. Blood consists of circulating cells, cellular fragments (platelets and microparticles), and plasma macromolecules. Blood cells and their fragments result from a highly-ordered process, hematopoiesis. Definitive hematopoiesis occurs in the bone marrow, where pluripotential stem cells give rise to multiple lineages of highly specialized cells. Highly-productive and continuously regenerative, hematopoiesis requires a microenvironment of mesenchymal cells and blood vessels. A Systems Biology Approach to Blood is divided into three main sections: basic components, physiological processes, and clinical applications. Using blood as a window, one can study health and disease through this unique tool box with reactive biological

fluids that mirrors the prevailing hemodynamics of the vessel walls and the various blood cell types. Many blood diseases, rare and common can and have been exploited using systems biology approaches with successful results and therefore ideal models for systems medicine. More importantly, hematopoiesis offers one of the best studied systems with insight into stem cell biology, cellular interaction, development; linage programing and reprograming that are every day influenced by the most mature and understood regulatory networks.

Cambridge Checkpoints VCE Biology Unit 3 2012 Frontiers Media SA

Since the discovery of the Warburg effect in the 1920s cancer has been tightly associated with the genetic and metabolic state of the cell. One of the hallmarks of cancer is the alteration of the cellular metabolism in order to promote proliferation and undermine cellular defense mechanisms such as apoptosis or detection by the immune system. However, the strategies by which this is achieved in different cancers and sometimes even in different patients of the same cancer is very heterogeneous, which hinders the design of general treatment options. Recently, there has been an ongoing effort to study this phenomenon on a genomic scale in order to understand the causality underlying the disease. Hence, current “omics” technologies have contributed to identify and monitor different biological pieces at different biological levels, such as genes, proteins or metabolites. These technological capacities have provided us with vast amounts of clinical data where a single patient may often give rise to various tissue samples, each of them being characterized in detail by genomescale data on the sequence, expression, proteome and metabolome level. Data with such detail poses the imminent problem of extracting meaningful interpretations and translating them into specific treatment options. To this purpose, Systems Biology provides a set of promising computational tools in order to decipher the mechanisms driving a healthy cell’s metabolism into a cancerous one. However, this enterprise requires bridging the gap between large data resources, mathematical analysis and modeling specifically designed to work with the available data. This is by no means trivial and requires high levels of communication and adaptation between the experimental and theoretical side of research.

The Smarter Screen Prentice Hall

The past 25 years has seen the emergence of a wealth of data suggesting that novel biological functions of known proteins play important roles in biology and medicine. This ability of proteins to exhibit more than one unique biological activity is known as protein moonlighting. Moonlighting proteins can exhibit novel biological functions, thus extending the function of the proteome, and are also implicated in the pathology of a growing number of idiopathic and infectious diseases. This book, written by a cell biologist, protein evolutionary biologist and protein bioinformatician, brings together the latest information on the structure, evolution and biological function of the growing numbers of moonlighting proteins that have been identified, and their roles in human health and disease. This information is revealing the enormous importance protein moonlighting plays in the maintenance of human health and in the induction of disease pathology. Protein Moonlighting in Biology and Medicine will be of interest to a general readership in the biological and biomedical research community. About the Authors Brian Henderson, Division of Infection and Immunity, University College London, London, UK Mario A. Fares, Institute of Integrative Systems Biology (CSIC?]UV), Valencia, Spain Trinity College Dublin, Dublin, Ireland Andrew C. R. Martin, Division of Biosciences, University College London, London, UK

Developing Assessments for the Next Generation Science Standards Springer

This exciting SpringerBrief presents evidence for new ideas that will challenge several theories of how cancer biology is understood. Cancer biology has undergone several intellectual revolutions in the past 50 years. A mutation-centric view of cancer has given way to the tumor microenvironment view. Reductionistic studies of one gene at a time have given way to systems biology approaches that analyze the whole genome (omics) at the same time. However, this text combines the complex levels studying cancer at the molecular biology level, endocrinology level, and transcriptomics level. What researchers are now realizing is that there is a need to combine omics with physiology concepts in order to better understand cancer and this book will give insight to the merging of these two fields in order to define how cancer is studied in the future.?

16th International Conference on Cyber Warfare and Security Springer Nature

A complete exploration of the real-world applications and implications of evolutionary psychology The exciting and sometimes controversial science of evolutionary psychology is becoming increasingly relevant to more fields of study than ever before. The Handbook of Evolutionary Psychology, Volume 2, Integrations provides students and researchers with new insight into how EP draws from, and is applied in, fields as diverse as economics, anthropology, neuroscience, genetics, and political science, among others. In this thorough revision and expansion of the groundbreaking handbook, luminaries in the field provide an in-depth exploration of the foundations of evolutionary psychology as they relate to public policy, consumer behavior, organizational leadership, and legal issues. Evolutionary psychology seeks to explain the reasons behind friendship, leadership, warfare, morality, religion, and culture — in short, what it means to be human. This enlightening text provides a foundational knowledgebase in EP, along with expert insights and the most up-to-date coverage of recent theories and findings. Explore the vast and expanding applications of evolutionary psychology Discover the psychology of human survival, mating parenting, cooperation and conflict, culture, and more Identify how evolutionary psychology is interwoven with other academic subjects and traditional psychological disciplines Discuss future applications of the conceptual tools of evolutionary psychology As the established standard in the field, The Handbook of Evolutionary Psychology, Volume 2 is the definitive guide for every psychologist and student to understand the latest and most exciting applications of evolutionary psychology.

Design of Biomedical Devices and Systems Springer

Systems Biology and the Challenge of Deciphering the Metabolic Mechanisms Underlying CancerFrontiers Media SA

Statistical Methods in Biology Springer

Asking Questions in Biology is all about scientific discovery. Biology students must be able to analyse data and produce high quality reports, but before this they need to work out exactly what it is they are trying to discover. Asking Questions in Biology begins with the often overlooked (yet crucial) skill of asking the right question, in the right way. It then moves on to present the tools and techniques required to gather data, analyse this data and finally to present this data (either orally or in a formal report).

Essential Cell Biology Frontiers Media SA

A leading behavioral economist reveals the tools that will improve our decision making on screens Office workers spend the majority of their waking hours staring at screens. Unfortunately, few of us are aware of the visual biases and behavioral patterns that influence our thinking when we’re on our laptops, iPads, smartphones, or smartwatches. The sheer volume of information and choices available online, combined with the ease of tapping "buy," often make for poor decision making on screens. In The Smarter Screen, behavioral economist Shlomo Benartzi reveals

a tool kit of interventions for the digital age. Using engaging reader exercises and provocative case studies, Benartzi shows how digital designs can influence our decision making on screens in all sorts of surprising ways. For example: • You're more likely to add bacon to your pizza if you order online. • If you read this book on a screen, you're less likely to remember its content. • You might buy an item just because it's located in a screen hot spot, even if better options are available. • If you shop using a touch screen, you'll probably overvalue the product you're considering. • You're more likely to remember a factoid like this one if it's displayed in an ugly, difficult-to-read font. Drawing on the latest research on digital nudging, Benartzi reveals how we can create an online world that helps us think better, not worse.

The Modern Synthesis Frontiers Media SA

Assessments, understood as tools for tracking what and how well students have learned, play a critical role in the classroom. Developing Assessments for the Next Generation Science Standards develops an approach to science assessment to meet the vision of science education for the future as it has been elaborated in A Framework for K-12 Science Education (Framework) and Next Generation Science Standards (NGSS). These documents are brand new and the changes they call for are barely under way, but the new assessments will be needed as soon as states and districts begin the process of implementing the NGSS and changing their approach to science education. The new Framework and the NGSS are designed to guide educators in significantly altering the way K-12 science is taught. The Framework is aimed at making science education more closely resemble the way scientists actually work and think, and making instruction reflect research on learning that demonstrates the importance of building coherent understandings over time. It structures science education around three dimensions - the practices through which scientists and engineers do their work, the key crosscutting concepts that cut across disciplines, and the core ideas of the disciplines - and argues that they should be interwoven in every aspect of science education, building in sophistication as students progress through grades K-12. Developing Assessments for the Next Generation Science Standards recommends strategies for developing assessments that yield valid measures of student proficiency in science as described in the new Framework. This report reviews recent and current work in science assessment to determine which aspects of the Framework's vision can be assessed with available techniques and what additional research and development will be needed to support an assessment system that fully meets that vision. The report offers a systems approach to science assessment, in which a range of assessment strategies are designed to answer different kinds of questions with appropriate degrees of specificity and provide results that complement one another. Developing Assessments for the Next Generation Science Standards makes the case that a science assessment system that meets the Framework's vision should consist of assessments designed to support classroom instruction, assessments designed to monitor science learning on a broader scale, and indicators designed to track opportunity to learn. New standards for science education make clear that new modes of assessment designed to measure the integrated learning they promote are essential. The recommendations of this report will be key to making sure that the dramatic changes in curriculum and instruction signaled by Framework and the NGSS reduce inequities in science education and raise the level of science education for all students.

Integrative Computational Systems Biology Approaches in Immunology and Medicine Cambridge University Press

One of the exciting aspects of being involved in the field of molecular biology is the ever-accelerating rate of progress, both in the development of new methodologies and the practical applications of these methodologies. This popular textbook has been completely revised and updated to provide a comprehensive overview and to reflect key developments in this rapidly expanding area. Chapters on the impact of molecular biology in the development of biotechnology have been fully updated and include the applications of molecular biology in the areas of diagnostics, biosensors and biomarkers, therapeutics, agricultural biotechnology and vaccines. The first six chapters deal with the technology used in current molecular biology and biotechnology. These primarily deal with core nucleic acid techniques, genomics, proteomics and recombinant protein production. Further chapters address major advances in the applications of molecular biotechnology. By presenting information in an easily assimilated form, this book makes an ideal undergraduate text. Molecular Biology and Biotechnology 6th Edition will be of particular interest to students of biology and chemistry, as well as to postgraduates and other scientific workers who need a sound introduction to this ever rapidly advancing and expanding area.

Quantum Effects in Biology Routledge

This volume provides a critical response to the COVID-19 pandemic showcasing the full range of issues and perspectives that the discipline of geography can expose and bring to the table, not only to this specific event, but to others like it that might occur in future. Comprised of almost 60 short (2500 word) easy to read chapters, the collection provides numerous theoretical, empirical and methodological entry points to understanding the ways in which space, place and other geographical phenomenon are implicated in the crisis. Although falling under a health geography book series, the book explores the centrality and importance of a full range of biological, material, social, cultural, economic, urban, rural and other geographies. Hence the book bridges fields of study and sub-disciplines that are often regarded as separate worlds, demonstrating the potential for future collaboration and cross-disciplinary inquiry. Indeed book articulates a diverse but ultimately fulsome and multiscalar geographical approach to the major health challenge of our time, bringing different types of scholarship together with common purpose. The intended audience ranges from senior undergraduate students and graduate students to professional academics in geography and a host of related disciplines. These scholars might be interested in COVID-19 specifically or in the book's broad disciplinary approach to infectious disease more generally. The book will also be helpful to policy-makers at various levels in formulating responses, and to general readers interested in learning about the COVID-19 crisis.

Pearson Education

Developmental biology is a subject that we believe is best taught by intensive exploration of fundamental problems and ideas rather than by a survey. We prepared our book because we were unable to find among the published texts satisfactory reading materials for this approach.