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A complete guide to the key statistical concepts essential for the design and construction of clinical trials As the newest major resource in the field of medical research, Methods and Applications of Statistics in Clinical Trials, Volume 1: Concepts, Principles, Trials, and Designs presents a timely and authoritative review of the central statistical concepts used to build clinical trials that obtain the best results. The reference unveils modern approaches vital to understanding, creating, and

evaluating data obtained throughout the various stages of clinical trial design and analysis. Accessible and comprehensive, the first volume in a two-part set includes newly-written articles as well as established literature from the Wiley Encyclopedia of Clinical Trials. Illustrating a variety of statistical concepts and principles such as longitudinal data, missing data, covariates, biased-coin randomization, repeated measurements, and simple randomization, the book also provides in-depth coverage of the various trial designs found within phase I-IV trials. *Methods and Applications of Statistics in Clinical Trials, Volume 1: Concepts, Principles, Trials, and Designs* also features: Detailed chapters on the type of trial designs, such as adaptive, crossover, group-randomized, multicenter, non-inferiority, non-randomized, open-labeled, preference, prevention, and superiority trials Over 100 contributions from leading academics, researchers, and practitioners An exploration of ongoing, cutting-edge clinical trials on early cancer and heart disease, mother-to-child human immunodeficiency virus transmission trials, and the AIDS Clinical Trials Group *Methods and Applications of Statistics in Clinical Trials, Volume 1: Concepts, Principles, Trials, and Designs* is an excellent reference for researchers, practitioners, and students in the fields of clinical trials, pharmaceuticals, biostatistics, medical research design, biology, biomedicine, epidemiology, and public health. The series of books discusses the physics of laser and matter interaction, fluid dynamics of high-temperature and high-density compressible plasma, and kinetic phenomena and particle dynamics in laser-produced plasma. The book (Vol.1) gives the physics of intense-laser absorption in matter and/or plasma in non-relativistic and relativistic laser-intensity regime. In many cases, it is explained with clear images of physics so that an intuitive understanding of individual physics is possible for non-specialists. For intense-laser of 10^{13} – 10^{16} W/cm², the laser energy is mainly absorbed via collisional process, where the oscillation energy is converted to thermal energy by non-adiabatic Coulomb collision with the ions. Collisionless interactions with the collective modes in plasma are also described. The main topics are the interaction of ultra-intense laser and plasma for the intensity near and over 10^{18} W/cm². In such regime, relativistic dynamics become essential. A new physics appears due to the relativistic effects, such as mass correction, relativistic nonlinear force, chaos physics of particle motions, and so on. The book provides clearly the theoretical base for challenging the laser-plasma interaction physics in the wide range of power lasers. It is suitable as a textbook for upper-undergraduate and graduate students as well as for readers who want to understand the whole physics structure about what happens when an intense-laser irradiates any materials including solids, gas etc. Explaining the physics intuitively without complicated mathematics, it is also a valuable resource for engineering students and researchers as well as for self-study. *Advances in Mathematical Chemistry and Applications* highlights the recent progress in the emerging discipline of discrete mathematical chemistry. Editors Subhash C. Basak, Guillermo Restrepo, and Jose Luis Villaveces have brought together 27 chapters written by 68 internationally renowned experts in these two volumes. Each volume comprises a wise integration of mathematical and chemical concepts and covers numerous applications in the field of drug discovery, bioinformatics, chemoinformatics, computational

biology, mathematical proteomics, and ecotoxicology. Volume 1 includes chapters on mathematical structural descriptors of molecules and biomolecules, applications of partially ordered sets (posets) in chemistry, optimal characterization of molecular complexity using graph theory, different connectivity matrices and their polynomials, use of 2D fingerprints in similarity-based virtual screening, mathematical approaches to molecular structure generation, comparability graphs, applications of molecular topology in drug design, density functional theory of chemical reactivity, application of mathematical descriptors in the quantification of drug-likeness, utility of pharmacophores in drug design, and much more. Brings together both the theoretical and practical aspects of the fundamental concepts of mathematical chemistry Covers applications in diverse areas of physics, chemistry, drug discovery, predictive toxicology, systems biology, chemoinformatics, and bioinformatics Revised 2015 edition includes a new chapter on the current landscape of hierarchical QSAR modelling About half of the book focuses primarily on current work, new applications, and emerging approaches for the mathematical characterization of essential aspects of molecular structure, while the other half describes applications of structural approach to new drug discovery, virtual screening, protein folding, predictive toxicology, DNA structure, and systems biology Technological advancements have extracted a vast amount of useful knowledge and information for applications and services. These developments have evoked intelligent solutions that have been utilized in efforts to secure this data and avoid potential complex problems. Advances in Secure Computing, Internet Services, and Applications presents current research on the applications of computational intelligence in order to focus on the challenge humans face when securing knowledge and data. This book is a vital reference source for researchers, lecturers, professors, students, and developers, who have interest in secure computing and recent advanced in real life applications. This book sets the innovative research contributions, works, and solutions for almost all the intelligent and smart applications in the smart cities. The smart city concept is a relevant topic for industrials, governments, and citizens. Due to this, the smart city, considered as a multi-domain context, attracts tremendously academics researchers and practitioners who provide efforts in theoretical proofs, approaches, architectures, and in applied researches. The importance of smart cities comes essentially from the significant growth of populations in the near future which conducts to a real need of smart applications that can support this evolution in the future cities. The main scope of this book covers new and original ideas for the next generations of cities using the new technologies. The book involves the application of the data science and AI, IoT technologies and architectures, smart earth and water management, smart education and E-learning systems, smart modeling systems, smart mobility, and renewable energy. It also reports recent research works on big data technologies, image processing and recognition systems, and smart security and privacy. This book is divided into five sections: the conceptual origins of the TALC, spatial relationships and the TALC, alternative conceptual approaches, renewing or retiring with the TALC, and predicting with the TALC. It concludes with a review of the future potential of the model in the area of the destination development process. This book

focuses on cases and studies of interest to mechanical engineers and industrial technicians. The considered applications in this volume are widely used in several industrial fields particularly in the automotive and aviation industries. Readers will understand the theory and techniques which are used in each application covered in each chapter. The book contents include the following topics: Numerical analysis of hydrokinetic turbines Computational fluid dynamics of a CuO based nanofluid in mini-channel cross-sections Orthodontic biomechanics of a NiTi arch wires Reynold's number effects on fluid flow through Savonius rotors Effect of operating parameters on Zn-Mn alloys deposited from additive-free chloride bath Optical properties and stability of a blue-emitting phosphor (Sr₂P₂O₇:Eu²⁺) Under UV and VUV excitation Numerical study of the influence of nanofluid type on thermal improvement in a three dimensional mini channel Electrochemical studies and characterization of Zn-Mn coatings deposited in the presence of novel organic additives Prediction of fire and smoke propagation under a range of external conditions Structural design of a 10 kW H-Darrieus wind turbine The presented case studies and development approaches aim to provide the readers, such as graduate students, PhD candidates and professionals with basic and applied information broadly related to mechanical engineering and technology. This book presents a compilation of extended version of selected papers from the 19th IEEE International Conference on Machine Learning and Applications (IEEE ICMLA 2020) and focuses on deep learning networks in applications such as pneumonia detection in chest X-ray images, object detection and classification, RGB and depth image fusion, NLP tasks, dimensionality estimation, time series forecasting, building electric power grid for controllable energy resources, guiding charities in maximizing donations, and robotic control in industrial environments. Novel ways of using convolutional neural networks, recurrent neural network, autoencoder, deep evidential active learning, deep rapid class augmentation techniques, BERT models, multi-task learning networks, model compression and acceleration techniques, and conditional Feature Augmented and Transformed GAN (cFAT-GAN) for the above applications are covered in this book. Readers will find insights to help them realize novel ways of using deep learning architectures and algorithms in real-world applications and contexts, making the book an essential reference guide for academic researchers, professionals, software engineers in the industry, and innovative product developers. Statistical methods book, with code on supporting website. Through expanded intelligence, the use of robotics has fundamentally transformed a variety of fields, including manufacturing, aerospace, medicine, social services, and agriculture. Continued research on robotic design is critical to solving various dynamic obstacles individuals, enterprises, and humanity at large face on a daily basis. Robotic Systems: Concepts, Methodologies, Tools, and Applications is a vital reference source that delves into the current issues, methodologies, and trends relating to advanced robotic technology in the modern world. Highlighting a range of topics such as mechatronics, cybernetics, and human-computer interaction, this multi-volume book is ideally designed for robotics engineers, mechanical engineers, robotics technicians, operators, software engineers, designers, programmers, industry professionals, researchers, students, academicians, and computer practitioners seeking current research on

developing innovative ideas for intelligent and autonomous robotics systems. This volume collects ten surveys on the modeling, simulation, and applications of active particles using methods ranging from mathematical kinetic theory to nonequilibrium statistical mechanics. The contributing authors are leading experts working in this challenging field, and each of their chapters provides a review of the most recent results in their areas and looks ahead to future research directions. The approaches to studying active matter are presented here from many different perspectives, such as individual-based models, evolutionary games, Brownian motion, and continuum theories, as well as various combinations of these. Applications covered include biological network formation and network theory; opinion formation and social systems; control theory of sparse systems; theory and applications of mean field games; population learning; dynamics of flocking systems; vehicular traffic flow; and stochastic particles and mean field approximation. Mathematicians and other members of the scientific community interested in active matter and its many applications will find this volume to be a timely, authoritative, and valuable resource. This book review series presents current trends in modern biotechnology. The aim is to cover all aspects of this interdisciplinary technology where knowledge, methods and expertise are required from chemistry, biochemistry, microbiology, genetics, chemical engineering and computer science. Volumes are organized topically and provide a comprehensive discussion of developments in the respective field over the past 3-5 years. The series also discusses new discoveries and applications. Special volumes are dedicated to selected topics which focus on new biotechnological products and new processes for their synthesis and purification. In general, special volumes are edited by well-known guest editors. The series editor and publisher will however always be pleased to receive suggestions and supplementary information. Manuscripts are accepted in English. This book prestigiously covers our current understanding of SiC as a semiconductor material in electronics. Its physical properties make it more promising for high-powered devices than silicon. The volume is devoted to the material and covers methods of epitaxial and bulk growth. Identification and characterization of defects is discussed in detail. The contributions help the reader to develop a deeper understanding of defects by combining theoretical and experimental approaches. Apart from applications in power electronics, sensors, and NEMS, SiC has recently gained new interest as a substrate material for the manufacture of controlled graphene. SiC and graphene research is oriented towards end markets and has high impact on areas of rapidly growing interest like electric vehicles. The list of contributors reads like a "Who's Who" of the SiC community, strongly benefiting from collaborations between research institutions and enterprises active in SiC crystal growth and device development. The MRS Symposium Proceeding series is an internationally recognised reference suitable for researchers and practitioners. This proceedings book is the fourth edition of a series of works which features emergent research trends and recent innovations related to smart city presented at the 5th International Conference on Smart City Applications SCA20 held in Safranbolu, Turkey. This book is composed of peer-reviewed chapters written by leading international scholars in the field of smart cities from around the world. This book covers all the smart city topics

including Smart Citizenship, Smart Education, Smart Mobility, Smart Healthcare, Smart Security, Smart Earth Environment & Agriculture, Smart Economy, Smart Factory and Smart Recognition Systems. This book contains a special section intended for Covid-19 pandemic researches. This book edition is an invaluable resource for courses in computer science, electrical engineering and urban sciences for sustainable development. Honey typically has a complex chemical and biochemical composition that invariably includes complex sugars, specific proteins, amino acids, phenols, vitamins, and rare minerals. It is reported to be beneficial in the treatment of various diseases, such as those affecting the respiratory, cardiovascular, gastrointestinal, and nervous systems, as well as diabetes mellitus and certain types of cancers; however, there is limited literature describing the use of honey in modern medicine. This book provides evidence-based information on the pharmaceutical potential of honey along with its therapeutic applications and precise mechanisms of action. It discusses in detail the phytochemistry and pharmacological properties of honey, highlighting the economic and culturally significant medicinal uses of honey and comprehensively reviewing the scientific research on the traditional uses, chemical composition, scientific validation, and general pharmacognostical characteristics. Given its scope, it is a valuable tool for researchers and scientists interested in drug discovery and the chemistry and pharmacology of honey.

The model system of eyeblink classical conditioning in humans has enormous potential for the understanding and application of fundamental principles of learning. This collection makes classical conditioning accessible to teachers and researchers in a number of ways. The first aim is to present the latest developments in theory building. Second, as background for the current directions, *Eyeblink Classical Conditioning, Volume I* presents an overview of a large body of previously published research on eyeblink classical conditioning. Last, the authors describe eyeblink classical conditioning techniques. Each chapter includes a highlighted methods section so that interested readers can replicate techniques for teaching and research. These notes represent our summary of much of the recent research that has been done in recent years on approximations and bounds that have been developed for compound distributions and related quantities which are of interest in insurance and other areas of application in applied probability. The basic technique employed in the derivation of many bounds is inductive, an approach that is motivated by arguments used by Sparre-Andersen (1957) in connection with a renewal risk model in insurance. This technique is both simple and powerful, and yields quite general results. The bounds themselves are motivated by the classical Lundberg exponential bounds which apply to ruin probabilities, and the connection to compound distributions is through the interpretation of the ruin probability as the tail probability of a compound geometric distribution. The initial exponential bounds were given in Willmot and Lin (1994), followed by the nonexponential generalization in Willmot (1994). Other related work on approximations for compound distributions and applications to various problems in insurance in particular and applied probability in general is also discussed in subsequent chapters. The results obtained or the arguments employed in these situations are similar to those for the compound distributions, and thus we felt it useful to include them

in the notes. In many cases we have included exact results, since these are useful in conjunction with the bounds and approximations developed. The purpose of this book is to present 10 scientific and engineering works whose numerical and graphical analysis were all constructed using the power of MATLAB® tools. The first five chapters of this book show applications in seismology, meteorology and natural environment. Chapters 6 and 7 focus on modeling and simulation of Water Distribution Networks. Simulation was also applied to study wide area protection for interconnected power grids (Chapter 8) and performance of conical antennas (Chapter 9). The last chapter deals with depth positioning of underwater robot vehicles. Therefore, this book is a collection of interesting examples of where this computational package can be applied. Chaos and nonlinear dynamics initially developed as a new emergent field with its foundation in physics and applied mathematics. The highly generic, interdisciplinary quality of the insights gained in the last few decades has spawned myriad applications in almost all branches of science and technology—and even well beyond. Wherever quantitative modeling and analysis of complex, nonlinear phenomena is required, chaos theory and its methods can play a key role. This volume concentrates on reviewing the most relevant contemporary applications of chaotic nonlinear systems as they apply to the various cutting-edge branches of engineering. The book covers the theory as applied to robotics, electronic and communication engineering (for example chaos synchronization and cryptography) as well as to civil and mechanical engineering, where its use in damage monitoring and control is explored). Featuring contributions from active and leading research groups, this collection is ideal both as a reference and as a ‘recipe book’ full of tried and tested, successful engineering applications. This book is a printed edition of the Special Issue "UAV or Drones for Remote Sensing Applications" that was published in Sensors. A practical book for practical people, Care-Giving in Dementia integrates neurobiological information about dementia with specific developments in care-giving. Multi-disciplinary and multi-professional in its approach, it emphasizes the variety of techniques that can be used effectively in caring for persons with dementia. This book brings together state-of-the-art advances in intelligent data analytics as driver of the future evolution of PaE systems. In the modern power and energy (PaE) domain, the increasing penetration of renewable energy sources (RES) and the consequent empowerment of consumers as a central and active solution to deal with the generation and development variability are driving the PaE system towards a historic paradigm shift. The small-scale, diversity, and especially the number of new players involved in the PaE system potentiate a significant growth of generated data. Moreover, advances in communication (between IoT devices and M2M: machine to machine, man to machine, etc.) and digitalization hugely increased the volume of data that results from PaE components, installations, and systems operation. This data is becoming more and more important for PaE systems operation, maintenance, planning, and scheduling with relevant impact on all involved entities, from producers, consumer,s and aggregators to market and system operators. However, although the PaE community is fully aware of the intrinsic value of those data, the methods to deal with it still necessitate substantial enhancements, development and research. Intelligent data analytics is thereby playing a

fundamental role in this domain, by enabling stakeholders to expand their decision-making method and achieve the awareness on the PaE environment. The editors also included demonstrated codes for presented problems for better understanding for beginners. Power electronics technology is still an emerging technology, and it has found its way into many applications, from renewable energy generation (i.e., wind power and solar power) to electrical vehicles (EVs), biomedical devices, and small appliances, such as laptop chargers. In the near future, electrical energy will be provided and handled by power electronics and consumed through power electronics; this not only will intensify the role of power electronics technology in power conversion processes, but also implies that power systems are undergoing a paradigm shift, from centralized distribution to distributed generation. Today, more than 1000 GW of renewable energy generation sources (photovoltaic (PV) and wind) have been installed, all of which are handled by power electronics technology. The main aim of this book is to highlight and address recent breakthroughs in the range of emerging applications in power electronics and in harmonic and electromagnetic interference (EMI) issues at device and system levels as discussed in robust and reliable power electronics technologies, including fault prognosis and diagnosis technique stability of grid-connected converters and smart control of power electronics in devices, microgrids, and at system levels. The proceeding presents best selected papers presented at 5th International Conference on Smart Computing and Informatics (SCI 2021), held at Department of Computer Science and Engineering, Vasvi College of Engineering, Hyderabad, Telangana, India, during 17-18 September 2021. It presents advanced and multi-disciplinary research towards the design of smart computing and informatics. The theme is on a broader front focuses on various innovation paradigms in system knowledge, intelligence and sustainability that may be applied to provide realistic solutions to varied problems in society, environment and industries. The scope is also extended towards the deployment of emerging computational and knowledge transfer approaches, optimizing solutions in various disciplines of science, technology and healthcare. The work is published in two volumes. This volume compiles eight recent surveys that present state-of-the-art results in the field of active matter at different scales, modeled by agent-based, kinetic, and hydrodynamic descriptions. Following the previously published volume, these chapters were written by leading experts in the field and accurately reflect the diversity of subject matter in theory and applications. Several mathematical tools are employed throughout the volume, including analysis of nonlinear PDEs, network theory, mean field approximations, control theory, and flocking analysis. The book also covers a wide range of applications, including: Biological network formation Social systems Control theory of sparse systems Dynamics of swarming and flocking systems Stochastic particles and mean field approximations Mathematicians and other members of the scientific community interested in active matter and its many applications will find this volume to be a timely, authoritative, and valuable resource. This series of books collects a diverse array of work that provides the reader with theoretical and applied information on data analysis methods, models, and techniques, along with appropriate applications. Volume 1 begins with an introductory chapter by Gilbert Saporta, a leading expert in the field, who summarizes

the developments in data analysis over the last 50 years. The book is then divided into three parts: Part 1 presents clustering and regression cases; Part 2 examines grouping and decomposition, GARCH and threshold models, structural equations, and SME modeling; and Part 3 presents symbolic data analysis, time series and multiple choice models, modeling in demography, and data mining. Applications of Modern Mass Spectrometry covers the latest advances in the use of mass spectrometry in scientific research. The series attempts to present readers information on the broad range of mass spectrometry techniques and configurations, data analysis and practical applications. Each volume contains contributions from eminent researchers who present their findings in an easy to read format. The multidisciplinary nature of the works presented in each volume of this book series make it a valuable reference on mass spectrometry to academic researchers and industrial R&D specialists in applied sciences, biochemistry, life sciences and allied fields. The first volume of the series presents 5 reviews: - Applications of mass spectrometry for the determination of the microbial crude protein synthesis in ruminants - Qualitative and quantitative LC-MS analysis in food proteins and peptides - Chemometrics as a powerful and complementary tool for mass spectrometry applications in life sciences - Recent developments of allied techniques of qualitative analysis of heavy metal ions in aqueous solutions with special reference to modern mass spectrometry - New techniques and methods in explosive analysis. Environmental analysis techniques have advanced due to the use of nanotechnologies in improving the detection sensitivity and miniaturization of the devices in analytical procedures. These allow for developments such as increases in analyte concentration, the removal of interfering species and improvements in the detection limits. Bridging a gap in the literature, this book uniquely brings together state-of-the-art research in the applications of novel nanomaterials to each of the classical components of environmental analysis, namely sample preparation and extraction, separation and identification by spectroscopic techniques. Special attention is paid to those approaches that are considered greener and reduce the cost of the analysis process both in terms of chemicals and time consumption. Advanced undergraduates, graduates and researchers at the forefront of environmental science and engineering will find this book a good source of information. It will also help regulators, decision makers, surveillance agencies and the organizations assessing the impact of pollutants on the environment.

1. We describe, at first in a very formal manner, our essential aim. Let m be an open subset of R^n , with boundary ∂m . In m and on ∂m we introduce, respectively, linear differential operators P and Q_j , $0 \leq j \leq n-1$. By "non-homogeneous boundary value problem" we mean a problem of the following type: let f and g_j , $0 \leq j \leq n-1$, be given in function space S and G , S being a space on m and the G_j spaces on ∂m ; we seek u in a function space U on m satisfying (1) $Pu = f$ in m , (2) $Q_j u = g_j$ on ∂m , $0 \leq j \leq n-1$. Q_j may be identically zero on part of ∂m , so that the number of boundary conditions may depend on the part of ∂m considered.

2. We take as "working hypothesis" that, for $f \in S$ and $g_j \in G_j$, the problem (1), (2) admits a unique solution $u \in U$, which depends continuously on the data. But for all linear problems, there is a large number of choices for the space S and $\{G_j\}$ (naturally linked together). Generally speaking, our aim is to

determine families of spaces \mathcal{F} and \mathcal{G} , associated in a "natural" way with problem (1), (2) and convenient for applications, and also all possible choices for u and \mathcal{F}, \mathcal{G} in these families. The growing number of scientific and technological applications of plasma physics in the field of Aerospace Engineering requires that graduate students and professionals understand their principles. This introductory book is the expanded version of class notes of lectures I taught for several years to students of Aerospace Engineering and Physics. It is intended as a reading guide, addressed to students and non-specialists to tackle later with more advanced texts. To make the subject more accessible the book does not follow the usual organization of standard textbooks in this field and is divided in two parts. The first introduces the basic kinetic theory (molecular collisions, mean free path, etc.) of neutral gases in equilibrium in connection to the undergraduate physics courses. The basic properties of ionized gases and plasmas (Debye length, plasma frequencies, etc.) are addressed in relation to their equilibrium states and the collisional processes at the microscopic level. The physical description of short and long-range (Coulomb) collisions and the more relevant collisions (elementary processes) between electrons' ions and neutral atoms or molecules are discussed. The second part introduces the physical description of plasmas as a statistical system of interacting particles introducing advanced concepts of kinetic theory, (non-equilibrium distribution functions, Boltzmann collision operator, etc). The fluid transport equations for plasmas of electron ions and neutral atoms and the hydrodynamic models of interest in space science and plasma technology are derived. The plasma production in the laboratory in the context of the physics of electric breakdown is also discussed. Finally, among the myriad of aerospace applications of plasma physics, the low pressure microwave electron multipactor breakdown and plasma thrusters for space propulsion are presented in two separate chapters.

Pattern recognition is a central topic in contemporary computer sciences, with continuously evolving topics, challenges, and methods, including machine learning, content-based image retrieval, and model- and knowledge-based - approaches, just to name a few. The Iberoamerican Congress on Pattern Recognition (CIARP) has become established as a high-quality conference, highlighting the recent evolution of the domain. These proceedings include all papers presented during the 15th edition of this conference, held in Sao Paulo, Brazil, in November 2010. As was the case for previous conferences, CIARP 2010 attracted participants from around the world with the aim of promoting and disseminating - going research on mathematical methods and computing techniques for pattern recognition, computer vision, image analysis, and speech recognition, as well as their applications in such diverse areas as robotics, health, entertainment, space exploration, telecommunications, data mining, document analysis, and natural language processing and recognition, to name only a few of them. Moreover, it provided a forum for scientific research, experience exchange, sharing new knowledge and increasing cooperation between research groups in pattern recognition and related areas. It is important to underline that these conferences have contributed significantly to the growth of national associations for pattern recognition in the Iberoamerican region, all of them as members of the International Association for Pattern Recognition (IAPR). This book gives a comprehensive

overview of the most advanced theories, methodologies and applications in computer vision. Particularly, it gives an extensive coverage of 3D and robotic vision problems. Example chapters featured are Fourier methods for 3D surface modeling and analysis, use of constraints for calibration-free 3D Euclidean reconstruction, novel photogeometric methods for capturing static and dynamic objects, performance evaluation of robot localization methods in outdoor terrains, integrating 3D vision with force/tactile sensors, tracking via in-floor sensing, self-calibration of camera networks, etc. Some unique applications of computer vision in marine fishery, biomedical issues, driver assistance, are also highlighted. The scientific field of data analysis is constantly expanding due to the rapid growth of the computer industry and the wide applicability of computational and algorithmic techniques, in conjunction with new advances in statistical, stochastic and analytic tools. There is a constant need for new, high-quality publications to cover the recent advances in all fields of science and engineering. This book is a collective work by a number of leading scientists, computer experts, analysts, engineers, mathematicians, probabilists and statisticians who have been working at the forefront of data analysis and related applications. The chapters of this collaborative work represent a cross-section of current concerns, developments and research interests in the above scientific areas. The collected material has been divided into appropriate sections to provide the reader with both theoretical and applied information on data analysis methods, models and techniques, along with related applications.

"Mathematics for Computer Graphics Applications is written for several audiences: for college students majoring in computer science, engineering, or applied mathematics and science, whose special interests are in computer graphics, CAD/CAM, geometric modeling, visualization, or related subjects; for industry and government on-the-job training of employees whose skills can be profitably expanded into these areas; and for the professional working in these fields in need of a comprehensive reference and skills refresher."--BOOK JACKET. This book contains a selection of papers that were initially presented at the 4th On-Line World Conference on Soft Computing in Industrial Applications that was held in September 1999. Soft Computing provides various methodologies for developing intelligent systems that offer competitive solutions to real world problems. This book is comprised of a unique collection of papers that provide a comprehensive overview of state-of-the-art-theory and successful industrial applications of soft computing around the world. It is written by some of the leading researchers in this field. This book is aimed at researchers and professional engineers who are engaged in developing intelligent systems as well as graduate students in science and engineering. There has been tremendous growth in the development of advanced marine vehicles over the last few decades and many of these developments have been presented at the International High Performance Marine Vehicles Conference held annually since 1997 in Shanghai, China. This comprehensive first volume covers high speed monohulls, multihulls, hydrofoil craft, air cavity craft and wing-in-ground effect craft. The papers cover a wide variety of hullforms, including deep-V hulls, stepped hulls, axe-bow hullforms, trimarans and pentamarans, foil assisted catamarans and air-lubrication craft. All aspects of design, including resistance, powering, seakeeping and maneuvering performance of these

vessels, are covered through theoretical, experimental and numerical investigations.

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