Arm und reich This book introduces the optical frequency-modulated continuous-wave (FMCW) interferometry - a new field of optics that is derived from radar. The study of optical FMCW interference not only updates our knowledge about the nature of light, but also creates an advanced technology for precision measurements. The principles, applications and signal processing of optical FMCW interference are systematically discussed. This book is intended for scientists and engineers in both academia and industry. It is especially suited to professionals who are working in the field of measurement instruments.

The Second Machine Age

Optical Frequency-Modulated Continuous-Wave (FMCW) Interferometry

Industrie 4.0 Maturity Index We all like to know how reliable and how risky certain situations are, and our increasing reliance on technology has led to the need for more precise assessments than ever before. Such precision has resulted in efforts both to sharpen the notions of risk and reliability, and to quantify them. Quantification is required for normative decision-making, especially decisions pertaining to our safety and wellbeing. Increasingly in recent years Bayesian methods have become key to such quantifications. Reliability and Risk provides a comprehensive overview of the mathematical and statistical aspects of risk and reliability analysis, from a Bayesian perspective. This book sets out to change the way in which we think about reliability and survival analysis by casting them in the broader context of decision-making. This is achieved by: Providing a broad coverage of the diverse aspects of reliability, including: multivariate failure models, dynamic reliability, event history analysis, non-parametric Bayes, competing risks, co-operative and competing systems, and signature analysis. Covering the essentials of Bayesian statistics and exchangeability, enabling readers who are unfamiliar with Bayesian inference to benefit from the book. Introducing the notion of composite reliability, or the collective reliability of a population of items. Discussing the relationship between notions of reliability and survival analysis and econometrics and financial risk. Reliability and Risk can most profitably be used by practitioners and research workers in reliability and survivability as a source of information, reference, and open problems. It can also form the basis of a graduate level course in reliability and risk analysis for students in statistics, biostatistics, engineering (industrial, nuclear, systems), operations research, and other mathematically oriented scientists, wherein the instructor could supplement the material

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with examples and problems.

Reliability and Risk An introductory text for scientists working in agriculture and experimental biology, and for undergraduate and postgraduate students of these subjects, including all the basic statistical methods which are appropriate to the work of such scientists. This edition (1st, 1983) includes new material on the effective use of computers for statistical analysis, increased emphasis on the role of models in analyzing data, and a new chapter on the analysis of multiple and repeated measurements. Annotation copyright by Book News, Inc., Portland, OR

Towards High-precision Machine Translation

Reference Points for Fisheries Management

Thomas Register The American military establishment is intimately tied to its technology, although the nature of those ties has varied enormously from service to service. The air force evokes images of pilots operating hightech weapons systems, striking precisely from out of the blue to lay waste to enemy installations. The fundamental icon for the Marine Corps is a wave of riflemen hitting the beaches from rugged landing craft and slogging their way ashore under enemy fire. How did these very different relationships with technology develop? During the interwar years, from 1920 to 1940, leaders from the Army Air Corps and the Marine Corps recreated their agencies based on visions of new military technologies. In War Machines, Timothy Moy examines these recreations and explores how factors such as bureaucratic pressure, institutional culture, and America's technological enthusiasm shaped these leaders' choices. The very existence of the Army Air Corps was based on a new technology, the airplane. As the Air Corps was forced to compete for money and other resources during the years after World War I, Air Corps leaders carved out a military niche based on hightech precision bombing. The Marine Corps focused on amphibious, firstwave assault using sturdy, graceless, and easytoproduce landing craft. Moy's astute analysis makes it clear that studying the processes that shaped the Army Air Corps and Marine Corps is fundamental to our understanding of technology and the military at the beginning of the twentieth century.

Precision Electroweak Physics at Electron-Positron Colliders Addressing the two major unit operations-mixing and extrusion-fundamental to processing elastomers and plastic materials, this reference summarizes design equations that can be employed effectively in scaling up product performance parameters, and contains a thorough survey of rheological principles. In addition, the book provides a wealth of practical information, relating molecular and compositional properties of polymers to processing characteristics and end-use properties so that engineers can select polymers suitable for specific equipment as well as products. Polymer Mixing and Extrusion Technology examines viscometric techniques and demonstrates their importance to product quality assurance reviews design-related literature/correlations and calculation procedures for mixing and extrusion defines needs and precision standards for setting up a polymer processing laboratory so that product quality control can be implemented in physical testing and processing research... plus more. Illustrated with over 200 diagrams, tables, and photographs that facilitate readers' understanding of the processes, Polymer Mixing and Extrusion Technology is an authoritative source for plastics, polymer, and chemical engineers, manufacturers of plastics processing equipment, and advanced undergraduate and graduate students in these disciplines.

Food security in a world of natural resource scarcity With the ability to reach many farmers with timely and accessible content, the use of information and communication technologies (ICTs) for agriculture (ICT4Ag) has the potential to transform farming and food production, worldwide. ICT4Ag supports new methods in the monitoring and management of soils, plants and livestock (precision agriculture), access to online markets, and improved communication between value chain stakeholders, among others. The services provided are vital in connecting farmers with the information they need to improve their agricultural productivity and reduce poverty. Through case studies and examples of ICT4Ag initiatives from across Asia, the Caribbean and sub-Saharan Africa, the first chapter looks at how ICT4Ag actually works to drive economic development across developing economies.
Recent Advancements in Gene Expression and Enabling Technologies in Crop Plants There has been a lively discussion recently on the service orientation of the economy. Service activities have gained importance in present-day economies, and this segment of the economy needs to be focussed on when discussing future growth potentials, employment opportunities, technological change, and international trade relations. In order to base the discussion on a consistent theoretical framework, this book employs input-output tables and related statistics. Following an introductory chapter in Part 1, the second part takes up service orientation in production based on time-series input-output tables covering the 1951-1985 period. Part 3 focuses on employment based on industry-occupation matrices which also span 35 years. Part 4 deals with the problem of linking real resource allocation distinguished by socio-economic purpose to the input-output framework.

Precision Journalism Major technological advances are necessary to reach the goal of feeding our world's growing population. To do this, there is an increasing demand within the agricultural field for rapid diagnostic tools to improve the efficiency of current methods in plant disease and DNA identification. The use of gold nanoparticles has emerged as a promising technology for a range of applications from smart agrochemical delivery systems to pathogen detection. In addition to this, advances in image classification analyses have allowed machine learning approaches to become more accessible to the agricultural field. Here we present the use of gold nanoparticles (AuNPs) for the detection of transgenic gene sequences in maize and the use of machine learning algorithms for the identification and classification of Fusarium spp. infected wheat seed. AuNPs show promise in their ability to diagnose the presence of transgenic insertions in DNA samples within 10 minutes through colorimetric response. Image-based analysis with the utilization of logistic regression, support vector machines, and k-nearest neighbors were able to accurately identify and differentiate healthy and diseased wheat kernels within the testing set at an accuracy of 95-98.8%. These technologies act as rapid tools to be used by plant breeders and pathologists to improve their ability to make selection decisions efficiently and objectively.

Drawing Blood This book is a translation of an important Japanese work on electronic ceramics and includes much experimental data. It will be of great interest to ceramicists and electronic engineers working with ceramic materials interested in an overview of recent Japanese research in this rapidly developing field.

Unmanned Aerial Systems in Agriculture This paper reviews the conceptual background and application of technical reference points in fishery management. Despite considerable investment in stock assessment methodology and expertise, fisheries worldwide are overexploited. This appears to be due to a mismatch between the precision of assessment and the precision of management. Two types of reference points are recognized: target reference points (TRPs) and limit reference points (LRPs). The use of MSY as a target reference point is considered in the light of past performance of fishery management, and it is suggested that MSY and other reference points formerly used as targets, may be more appropriately applied as LRPs. The recent trend towards the quantification of uncertainty and estimation of risk in the provision of advice is considered to be good, but the cost and availability of information and expertise required may preclude the use of these techniques for many small or low value stocks and for most stocks in developing countries. The recent trend towards inclusion of ecosystem concepts in setting fishery management objectives is also seen as good, and overdue. Although still in their formative stages, ecosystem concepts can still provide LRPs. Effective management will require a set of rules comprising both TRPs and LRPs. In most national and international fishery management situations, the current institutional structure will probably require some modification in order to successfully apply these sets of rules. Fisheries management organizations will continue to assess and manage fisheries routinely, but management may need to develop an independent review which comes into play when resource production limits are approached. The action to be taken at such limits should be discussed and agreed in advance.

Wireless Positioning Technologies and Applications Precision Journalism introduces professional journalists and students to quantitative research methods essential to their work. It is a comprehensive and accessible guide to news gathering techniques such as public opinion polling and content analysis. Step-by-step, the elements and procedures of social research are clearly and concisely described. This practical volume is an ideal text supplement for journalism courses and an easy-to-use reference tool for working journalists.
Understanding the Value Proposition Unmanned Aerial Systems Provide During the Phases of the Crop Cycle In this book, authors who are experts in their fields describe current advances on commercial crops and key enabling technologies that will underpin future advances in biotechnology. They discuss state of the art discoveries as well as future challenges. Tremendous progress has been made in introducing novel genes and traits into plant genomes since the first creation of transgenic plants thirty years ago, and the first commercialization of genetically modified maize in 1996. Consequently, cultivation of biotech crops with useful traits has increased more than 100-fold from 1.7 million hectares in 1996 to over 175 million hectares globally in 2013. This achievement has been made possible by continued advances in understanding the basic molecular biology of regulatory sequences to modulate gene expression, enhancement of protein synthesis and new technologies for transformation of crop plants. This book has three sections that encompass knowledge on genetically modified (GM) food crops that are currently used by consumers, those that are anticipated to reach the market place in the near future and enabling technologies that will facilitate the development of next generation GM crops. Section I focuses only on genetically modified maize and soybean (3 chapters each), while Section II discusses the GM food crops rice, wheat, sorghum, vegetables and sugar cane. Section III covers exciting recent developments in several novel enabling technologies, including gene targeting, minichromosomes, and in planta transient expression systems.

Multilayer Ceramic Substrate - Technology for VLSI Package/Multichip Module Irrigation came to the arid West in a wave of optimism about the power of water to make the desert bloom. Mark Fiege’s fascinating and innovative study of irrigation in southern Idaho’s Snake River valley describes a complex interplay of human and natural systems. Using vast quantities of labor, irrigators built dams, excavated canals, laid out farms, and brought millions of acres into cultivation. But at each step, nature rebounded and compromised the intended agricultural order. The result was a new and richly textured landscape made of layer upon layer of technology and intractable natural forces—one that engineers and farmers did not control with the precision they had anticipated. Irrigated Eden vividly portrays how human actions inadvertently helped to create a strange and sometimes baffling ecology.

Animal Welfare in a Changing World

Smart Sensors for Industrial Internet of Things

Generation of Precision Artwork for Printed Circuit Boards This book brings together the latest research in smart sensors technology and exposes the reader to myriad industrial applications that this technology has enabled. The book emphasizes several topics in the area of smart sensors in industrial real-world applications. The contributions in this book give a broader view on the usage of smart sensor devices covering a wide range of interdisciplinary areas like Intelligent Transport Systems, Healthcare, Agriculture, Drone communications and Security. By presenting an insight into Smart Sensors for Industrial IoT, this book directs the readers to explore the utility and advancement in smart sensors and their applications into numerous research fields. Lastly, the book aims to reach through a mass number of industry experts, researchers, scientists, engineers, and practitioners and help them guide and evolve to advance research practices.

Why Invest in ICTs for agriculture?


Extension Education in Animal Husbandry, Dairy and Fisheries Sectors

Soviet Advanced Manufacturing Technology and Western Export Controls Designed as a laboratory workbook, introducing simple ideas within the reader's experience and building upon them in order to enable students to present results in a clear and accurate manner, before mastering the underlying theory.

Three-dimensional Surface Topography This fully illustrated text explains the basic measurement techniques, describes the commercially available instruments and provides an overview of the current perception of 3-D topography analysis in the academic world and industry, and the commonly used 3-D parameters and plots for the characterizing and visualizing 3-D surface topography. It also includes new sections providing full treatment of surface characterization, filtering technology and engineered surfaces, as well as a fully updated bibliography.

Statistical Methods in Agriculture and Experimental Biology

Precision Diagnostics and Innovations for Plant Breeding Research At last, here is a comprehensive book that puts full details on all short-range wireless-positioning methods at your command for instant access and use. This one-stop resource surveys each technique's theory of operation, advantages and disadvantages, applicability in different domains, implementation procedures, and accuracy to help you select the right technology for any application and ensure the best results possible. Real-life examples together with 161 diagrams help bring all options into sharp focus. After introducing wireless positioning fundamentals along with various personal, commercial, and industrial applications, the book guides you step by step through radio signal time of flight methods, the signal strength method, the angle of arrival system, and the geometric use of distance measurement to determine location. It discusses location awareness applications and implementations using cellular networks. You are brought up to speed on fast-developing techniques involving local area networks (WLANs), personal area networks (WPANs), and radio frequency ID (RFID). Moreover, you find coverage of the distance measurement features in the new IEEE 802.15.4a spec for low rate wireless personal area networks. This practical resource offers detailed guidance on how to implement important technologies, including direct sequence spread spectrum, frequency hopping spread spectrum, and ultrawideband (UWB). The book also explores ways to counteract accuracy impairments caused by noise, multipath and fading, and limitations of antenna directivity and time measurement precision.

War Machines The reprint edition of a 1991 guide to "precision journalism," which uses social science research methods to increase the depth and accuracy of news stories. The method is in contrast to the more artful approach of "new journalism" writers like Tom Wolfe who use short-story techniques to illuminate nonfiction. Meyer (journalism, U. of North Carolina at Chapel Hill) covers the history of journalism in the scientific tradition; elements and techniques of data analysis; the use of statistics, computers, surveys, and field experiments; database applications; election surveys; and the politics of precision journalism.

Experimental Measurements The coming years will see two new GNSS (Galileo and BeiDou), and two RNSS (QZSS and NavIC), reach full operational capability. In parallel, the modernisation of existing GNSS (GPS and GLONASS) is also well underway. Thus, in just a few years there will be four global and three regional satellite navigation systems, and more than 100 satellites providing open access to more accurate and reliable PNT services, including through the use of multiple frequencies. Public augmentation systems, such as EGNOS, are also evolving to become multi-constellation and multi-frequency. A very clear trend identified in
the previous issue of this report was widespread support for multiple constellations, which is confirmed here as the baseline for today's new receivers. The most important new trend identified in this issue is the rapid adoption of multiple frequencies (almost 10 percentage points more in the last two years) - including for consumer devices, as evidenced by the market introduction of the first dual-frequency smartphone in May 2018. The second frequency of choice for these new devices is E5a/L5, which has either already been adopted or is planned to be supported by all global constellations, with efforts led by Galileo. Beyond the maturity and evolution of the core upstream infrastructure (GNSS, RNSS, SBAS), and owing to the possibilities it offers, we also observe the growth of new value-added services proposed by the system providers themselves, or by private industry. This is particularly true of high-accuracy services, which until recently were offered primarily to professional users in the surveying, mapping, engineering or precision agriculture domains, but are now propagating out to the mass market - not just for driverless cars, but also for all kinds of augmented reality applications. New service providers emerge, new alliances appear, and new distribution methods are proposed, including via mobile telephone networks, to serve the emerging "high accuracy for all" markets. The free Galileo High-Accuracy Service (HAS) and QZSS Centimetre-Level Accuracy Service (CLAS) are just two examples of this tendency. In addition to the trend for high accuracy, there is a growing awareness of the need to ensure both safety and security of the PNT solutions. This trend is especially important where PNT will be at the core of systems where humans are out of the control loop, such as in autonomous vessels, cars or drones. Galileo authentication services, namely the Navigation Message Authentication (NMA) and the Signal Authentication Services (SAS), are important contributions to this security. At least one leading private GNSS augmentation service provider has begun marketing "trusted positioning" through "real-time ephemeris data and navigation message authentication", confirming that high accuracy is not the endgame, but rather 'trusted and resilient' high accuracy remains the ultimate goal. This flourishing offer of core and augmentation services means that the choices available to receiver manufacturers, system integrators and application developers are more diverse than ever before. In the mass market domain, we are seeing a divide between chipsets optimised for 'entry level' IoT products, where energy per fix is the primary driver, and 'high end', where positioning performance is more important. The former receivers tend to be single (or dual) constellation, single frequency, narrow band; all factors that contribute to satisfying the requirements for very low power consumption. The latter have widely adopted multiple constellations (four GNSS), wider band processing, with up to 80 channels, and the most advanced versions now offer dual frequency capability, which leads to greater accuracy. The transport and safety critical domain is traditionally constrained by regulations and standards, and therefore slower in adopting new technologies. The emergence of the driverless car, professional or 'prosumer' drones, and autonomous vessel developments have shaken this segment of the industry, and it is now evolving at a very fast pace for these, as yet unregulated, applications. Multiple constellation, multiple frequency, INS hybridisation, and sensor fusion are all being used to contribute to the required 'assured' and safe positioning solutions. Whilst current solutions demonstrate that the high accuracy essential to autonomous applications is achievable, work is still required to reach the high levels of integrity, continuity, and security that must be guaranteed for safety-of-life applications. In the professional domain, high accuracy is achieved with triple or quadruple frequency receivers, using all constellations and signals as well as RTK, NRTK and increasingly real time PPP augmentation services. Receivers have several hundreds of channels, and have started to allocate some of these to detecting unwanted (jamming, spoofing, or multipath) signals. The combined availability of powerful mobile computers, tablets, or even smartphones, and of affordable dual frequency chipsets developed for the mass market, make it possible to run high-accuracy PVT solutions on such devices. By adding application-specific software, these developments combine to enable mapping, GIS data collection, and potentially surveying applications on consumer electronics devices. This is further supported by the availability of GNSS raw measurements on Android devices. Many of the technical advances observed in this report are driven by the will to use GNSS-derived position or time not only for information purposes, but also for monitoring, and increasingly today for controlling tasks, such as those encountered in robotics or navigation of all kinds of unmanned carriers. The 'Editor's special' section of this issue is devoted to automation, and to the increasingly important role GNSS plays in a number of partially- or fully-automated tasks and functions. The most publicised examples are found in the transport domain, with driverless cars, autonomous vessels and drones, but as the interested reader will see, GNSS-based automation applications go well beyond transport. The analysis of GNSS user technology trends is supported by testimonials from key suppliers of receiver technology: Broadcom, Javad, Kongsberg, Leica, Maxim Integrated, Meinberg, Novatel, Orolia-Spectracom, Qualcomm, Septentrio, STMicroelectronics, Thales, Trimble and u-blox presenting their latest innovations in the field.
Sustainable Intensification to Advance Food Security and Enhance Climate Resilience in Africa Achieving food security and economic developmental objectives in the face of climate change and rapid population growth requires systems modelling approaches, for example in the design of sustainable agriculture farming systems. Such approaches increase our understanding of system responses to different soil and climatic conditions, and provide insights into the effects of various variable climate change scenarios, providing valuable information for decision-makers. Further, in the agricultural sector, systems modelling can help optimise crop management and adaptation measures to boost productivity under variable climatic conditions. Presenting key outcomes from crop models used in agricultural systems this book is a valuable resource for professionals interested in using modelling approaches to manage the growth and improve the quality of various crops.

GNSS User Technology Report Increasing crop productivity is a challenge as old as human history. Advancements in technology have allowed farmers to produce ever-increasing amounts of food on a given amount of land. With the world’s population expected to reach roughly nine billion by 2050 (United Nations 2013), the demand for food will require increasingly improved methods of agricultural production. One of these potential methods is the use of unmanned aerial vehicles (UAVs) to monitor crop health and identify potential issues. This thesis will explore how current stakeholders plan to utilize this technology and the perceived value they believe it will deliver across the various phases of the crop cycle. This thesis begins by reviewing modern precision agriculture management practices and discussing how remote sensing plays a role in improving the efficiency of these types of farming methods. It also identifies a number of challenges facing the industry to include the impact of current regulations on the market. This thesis develops a stakeholder value network that clarifies the tangible and intangible value exchanges between the focal organization and its stakeholders. As well as constructing an OPM (Object Process Methodology) model to describe the system and demonstrate the stakeholder interactions and system process and sub-process decomposition. It also provides visual display of how the value is delivered across these processes. The final aspect of the research for this thesis is to identifies the lead users for these systems and determines how they measure the value of the data provided by UAVs for remote sensing and crop management decisions in support of farming operations. The value proposition for the various crop phases and the ideal uses cases discussed by lead users in this thesis may be used to guide future research in agriculture technology development, and drive further innovation in the emerging field of commercial unmanned aerial system use.

Service to an Interdisciplinary Need-group from Computerized Secondary Services This up-to-date volume reviews the recent contributions of electron-positron colliders to the precision test of the electroweak Standard Model. In particular, it contains a short summary of the measurements at the Z resonance and gives an overview of the electroweak processes above the Z. Subsequently, the measurement of the W mass at LEP is discussed in detail. The implications for the precision test of the Standard Model are presented, giving the status of the global electroweak fit before the startup of Large Hadron Collider. The final chapters give an outlook on the electroweak physics at a future linear collider. The book also features many illustrations and tables. Readers obtain a coherent overview of the results of 20 years of electroweak physics conducted at electron-positron colliders.

Deutschlands Handelsflotte 1970

Systems Modeling Mechanical processing by cold-forming has been gaining in popularity because of the advantages it offers: low specific metal and energy consumption, high production rate, high accuracy of parts worked and low cost. The level to which cold-forming of metals has developed and the extent to which it is applied in all branches of the machine construction industry can be regarded as an index of the technical progress that characterizes this field. The volume provides an international overview on the most recent scientific and technical achievements of cold-forming, as well as the results of the author's own research work. Also included are examples which will be useful in issuing technologies and designing tools. The volume is designed to be of service to both higher education and modern industry, and its presentation has been devised so that all topics are easily accessible. It will be of considerable interest to students of machine construction, and mechanics, design engineers, and specialists in mechanical cold-forming.
Printed Circuit Board Precision Artwork Generation and Manufacturing Methods

Global food supply for the increasing population depends on agriculture and its allied sectors, animal husbandry and fisheries sectors. Food security and nutritional security could be achieved with production of clean meat, milk, egg and fish (rich in HUFAs), since they are highly nutritious for the health conscious consumers. There is a need to re-look and reorient the existing programs in extension education for effective transfer of technology and dissemination of technologies developed in Universities and Research Institutes, to reach the un-reached. Assessment, refinement and dissemination of technologies to bridge the gap among the entrepreneurs and farming community is addressed. This book contains papers written by different experts in the area will help to plan strategies to achieve sustainable growth in livestock and fisheries sectors. ICT, marketing strengthening, production of clean milk, meat and fish and value addition to these products are emphasized. Market lead extension, contract farming and high-tech and precision farming are the new approaches underlined. This book is useful for researchers, teachers, students, extension & field personnel, entrepreneurs, farmers.

Irrigated Eden

This 32-chapter volume represents the core of several oral and poster presentations made at the conference. In addition to Introduction and Conclusion sections, the book is thematically divided into 7 sections, namely, 1) Land Use and Farming Systems, 2) Effects of Climate Change on Crop Yield, 3) Soil Nutrient and Water Management for Carbon Sequestration, 4) Rehabilitation of Degraded Lands through Forestry and Agroforestry, 5) Management of Animal Production for Greenhouse Gas Emissions, 6) Smallholder Adaptation to Climate Change, and 7) Economic, Social and Policy Issues. It addresses these themes in the context of sustainable intensification (SI). It implies increasing agronomic production from the existing land while improving/restoring its quality and decreasing the C or environmental footprint. Simply put, SI means producing more from less.

Margins of Precision

In recent years, the agribusiness industry has been trying to keep pace with rapid developments, one of which is in the sector of small unmanned aerial systems (UASs). These systems have gained the attention of growers and researchers alike. Undeniably, the reach of this technology in agricultural decision making is only limited by the imagination. We must look beyond small UAS to realize the full potential of UAS technologies in precision agriculture. This publication describes the domain of mid-sized UAS with pertinent discussions on their suitable use, including case-study scenarios of such in agricultural production management.

Measurement of Services in an Input-output Framework

The world’s population is expected to reach 9 billion by 2050. Climate change, population, and income growth will drive food demand in the coming decades. Baseline scenarios show food prices for maize, rice, and wheat would significantly increase between 2005 and 2050, and the number of people at risk of hunger in the developing world would grow from 881 million in 2005 to more than a billion people by 2050. Food Security in a World of Natural Resource Scarcity: The Role of Agricultural Technologies examines which current and potential strategies offer solutions to fight hunger. The type and effectiveness of agricultural technologies are highly debated, and the debates are often polarized. Technology options are many, but transparent evidence-based information has been inconclusive or scarce. This book endeavors to respond to the challenge of growing food sustainably without degrading our natural resource base. The authors use a groundbreaking modeling approach that combines comprehensive process-based modeling of agricultural technologies with sophisticated global food demand, supply, and trade modeling. This approach assesses the yield and food impact through 2050 of a broad range of agricultural technologies under varying assumptions of climate change for the three key staple crops: maize, rice, and wheat. Geared toward policymakers in ministries of agriculture and national agricultural research institutes, as well as multilateral development banks and the private sector, Food Security in a World of Natural Resource Scarcity provides guidance on various technology strategies and which to pursue as competition grows for land, water, and energy across productive sectors and even increasingly across borders. The book is an important tool for targeting investment decisions today and going forward.

Cold-pressing Technology

“Boldly and skillfully, Wailoo analyzes not only the role of physicians but of research hospitals and pharmaceutical companies. In addition, he shows how things like race, gender, and lifestyle influenced how physicians defined and responded to the very diseases that were called into
existence by the new technologies they employed." -- James H. Jones, American Historical Review In Drawing Blood, medical historian Keith Wailoo uses the story of blood diseases to explain how physicians in this century wielded medical technology to define disease, carve out medical specialties, and shape political agendas. As Wailoo's account makes clear, the seemingly straightforward process of identifying disease is invariably influenced by personal, professional, and social factors -- and as a result produces not only clarity and precision but also bias and outright error. Drawing Blood reveals the ways in which physicians and patients as well as the diseases themselves are simultaneously shaping and being shaped by technology, medical professionalization, and society at large. This thought-provoking cultural history of disease, medicine, and technology offers an important perspective for current discussions of HIV and AIDS, genetic blood testing, prostate-specific antigen, and other important issues in an age of technological medicine. "Wailoo's analysis breaks new ground he uses a wide array of sources and types of data to carry out an insightful analysis of a diverse sample of 20th-century hematologic diseases." -- Robert A. Aronowitz, M.D., New England Journal of Medicine " Drawing Blood makes clear that the high stakes involved in medical technology are not just financial, but moral and far reaching. They have been harnessed to describe clinical phenomena and to reflect social and cultural realities that influence not only medical treatment but self-identity, power, and authority." -- Susan E. Lederer, H-Net Humanities & Social Sciences On Line "Wailoo's masterful study of hematology and its disease discourse is a model of interdisciplinarity, combining cultural analysis, social history, and the history of medical ideas and technology to produce a complex narrative of disease definition, diagnosis, and treatment He reminds us that medical technology is a neutral artifact of history. It can be, and has been, used to clarify and to cloud the understanding of disease, and it has the potential both to constrain and to emancipate its Subjects." -- Regina Morantz-Sanchez, Journal of Interdisciplinary History

Polymer Mixing and Extrusion Technology Contemporary and challenging, this thought-provoking book outlines a number of the key dilemmas in animal welfare for today's, and tomorrow's, world. The issues discussed range from the welfare of hunted animals, to debates around intensive farming versus sustainability, and the effects of climate and environmental change. The book explores the effects of fences on wild animals and human impacts on carrion animals; the impacts of tourism on animal welfare; philosophical questions about speciesism; and the quality and quantity of animal lives. The welfare impacts of human-animal interactions are explored, including human impacts on marine mammals, fish, wildlife, and companion and farm animals. Animal Welfare in a Changing World provides: Concise, opinion-based views on important issues in animal welfare by world experts and key opinion leaders. Pieces based on experience, which balance evidence-based approaches and the welfare impacts of direct engagement through training, campaigning and education. A wide-ranging collection of examples and descriptions of animal welfare topics which outline dilemmas in the real world, that are sometimes challenging, and not always comfortable reading. This is a 'must-read' book for animal and veterinary scientists, ethologists, policy and opinion leaders, NGOs, conservation biologists and anyone who feels passionately about the welfare of animals.

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