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Mathematikunterricht im Kontext von Realität, Kultur und Lehrerprofessionalität Werner Blum 2012-03-20 ?Mathematikunterricht aus verschiedenen Perspektiven zu betrachten und wissenschaftlich zu untersuchen, erweitert die Sicht auf das Lernen und Lehren von Mathematik. In dem Buch werden vier große Bereiche beleuchtet, die insbesondere die jahrzehntelangen Forschungsfelder von Gabriele Kaiser kennzeichnen: mathematisches Modellieren, sprachliche und kulturelle Einflüsse auf das Mathematiklernen, Lehrerprofessionsforschung sowie Theoriebildung in der Mathematikdidaktik. Zu diesen Bereichen haben national und international ausgewiesene Expertinnen und Experten Beiträge geleistet, um Gabriele Kaiser aus Anlass ihres 60. Geburtstags zu ehren. Das Buch enthält aktuelle Ergebnisse empirischer Untersuchungen und theoretische Perspektiven in Bezug auf einzelne Aspekte des Wirkens der Jubilarin.

Handbook of Research on Wireless Multimedia: Quality of Service and Solutions Cranley, Nicola 2008-07-31 "This book highlights and discusses the underlying QoS issues that arise in the delivery of real-time multimedia services over wireless networks"--Provided by publisher.

Mathematical Modelling in Education Research and Practice Gloria Ann Stillman 2015-07-20 In this volume cultural, social and cognitive influences on the research and teaching of mathematical modelling are explored from a variety of theoretical and practical perspectives. The authors of the current volume are all members of the International Community of Teachers of Mathematical Modelling and Applications, the peak research body in this field. A distinctive feature of this volume is the high number of authors from South American countries. These authors bring quite a different perspective to modelling than has been showcased in previous books in this series, in particular from a cultural point of view. As well as recent international research, there is a strong emphasis on pedagogical issues including those associated with technology and assessment, in the teaching and learning of modelling. Applications at various levels of education are exemplified. The contributions reflect common issues shared globally and represent emergent or on-going challenges.

Visualization in Science Education John K. Gilbert 2006-03-30 This book addresses key issues concerning visualization in the teaching and learning of science at any level in educational systems. It is the first book specifically on visualization in science education. The book draws on the insights from cognitive psychology, science, and education, by experts from five countries. It unites these with the practice of science education, particularly the ever-increasing use of computer-managed modelling packages.

Mitteilungen der Astronomischen Gesellschaft Astronomische Gesellschaft (Germany) 2007

Energy and Water Development Appropriations for 2009 United States. Congress. House. Committee on Appropriations. Subcommittee on Energy and Water Development 2008

Techniques and Applications for Advanced Information Privacy and Security: Emerging Organizational, Ethical, and Human Issues Nemati, Hamid 2009-03-31 "This book provides a thorough understanding of issues and concerns in information technology security"--Provided by publisher.

CORP 007 Proceedings REAL CORP 2007

Handbook of Research on Science Education Norman G. Lederman 2014-07-11 Building on the foundation set in Volume I—a landmark synthesis of research in the field—Volume II is a comprehensive, state-of-the-art new volume highlighting new and emerging research perspectives. The contributors, all experts in their research areas, represent the international and gender diversity in the science education research community. The volume is organized around six themes: theory and methods of science education research; science learning; culture, gender, and society and science learning; science teaching; curriculum and assessment in science; science teacher education. Each chapter presents an integrative review of the research on the topic it addresses—pulling together the existing research, working to understand the historical trends and patterns in that body of scholarship, describing how the issue is conceptualized within the literature, how methods and theories have shaped the outcomes of the research, and where the strengths, weaknesses, and gaps are in the literature. Providing guidance to science education faculty and graduate students and leading to new insights and directions for future research, the Handbook of Research on Science Education, Volume II is an essential resource for the entire science education community.

Workbook for Matteson/Kennedy/Baur's Project Lead the Way: Civil Engineering and Architecture Donna Matteson 2013-01-01 Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Teaching through Multi-User Virtual Environments: Applying Dynamic Elements to the Modern Classroom Vincenti, Giovanni 2010-08-31 Teaching through Multi-User Virtual Environments: Applying Dynamic Elements to the Modern Classroom highlights the work of educators daring enough to teach in these new frontiers of education. This timely publication is a must-read for all educators and practitioners, of any subject and at any level, who wish to incorporate a dynamic online element to their classroom. It is also meant for researchers of education, computer science, and instructional technologies. Teaching through Multi-User Virtual Environments: Applying Dynamic Elements to the Modern Classroom is a one-stop resource for practices, as well as research activities, within the domain on Multi-User Virtual Environments.

Proceedings of ICLS 2006 Sasha A. Barab 2006

Generalized Fractional Order Differential Equations Arising in Physical Models Santanu Saha Ray 2018-11-13 This book analyzes the various semi-analytical and analytical methods for finding approximate and exact solutions of fractional order partial differential equations. It explores approximate and exact solutions obtained by various analytical methods for fractional order partial differential equations arising in physical models.

Nanoelectronic Coupled Problems Solutions E. Jan W. ter Maten 2019-11-06 Designs in nanoelectronics often lead to challenging simulation problems and include strong feedback couplings. Industry demands provisions for variability in order to guarantee quality and yield. It also requires the incorporation of higher abstraction levels to allow for system simulation in order to shorten the design cycles, while at the same time preserving accuracy. The methods developed here promote a methodology for circuit-and-system-level modelling and simulation based on best practice rules, which are used to deal with coupled electromagnetic field-circuit-heat problems, as well as coupled electro-thermal-stress problems that emerge in nanoelectronic designs. This book covers: (1) advanced monolithic/multirate/co-simulation techniques, which are combined with envelope/wavelet approaches to create efficient and robust simulation techniques for strongly coupled systems that exploit the different dynamics of sub-systems within multiphysics problems, and which allow designers to predict reliability and ageing; (2) new generalized techniques in Uncertainty Quantification (UQ) for coupled problems to include a variability capability such that robust design and optimization, worst case analysis, and yield estimation with tiny failure probabilities are possible (including large deviations like 6-sigma); (3) enhanced sparse, parametric Model Order Reduction techniques with a posteriori error estimation for coupled problems and for UQ to reduce the complexity of the sub-systems while ensuring that the operational and coupling parameters can still be varied and that the reduced models offer higher abstraction levels that can be efficiently simulated. All the new algorithms produced were implemented, transferred and tested by the EDA vendor MAGWEL. Validation was conducted on industrial designs provided by end-users from the semiconductor industry, who shared their feedback, contributed to the measurements, and supplied both material data and process data. In closing, a thorough comparison to measurements on real devices was made in order to demonstrate the algorithms' industrial applicability.

Fulfilling the Potential of Women in Academic Science and Engineering Act of 2008 United States. Congress. House. Committee on Science and Technology (2007). Subcommittee on Research and Science Education 2008

Data Mining: Concepts, Methodologies, Tools, and Applications Management Association, Information Resources 2012-11-30 Data mining continues to be an emerging interdisciplinary field that offers the ability to extract information from an existing data set and translate that knowledge for end-users into an

understandable way. **Data Mining: Concepts, Methodologies, Tools, and Applications** is a comprehensive collection of research on the latest advancements and developments of data mining and how it fits into the current technological world.

Thermal and Electro-Thermal System Simulation Márta Rencz 2019-11-18 With increasing power levels and power densities in electronics systems, thermal issues are becoming more and more critical. The elevated temperatures result in changing electrical system parameters, changing the operation of devices, and sometimes even the destruction of devices. To prevent this, the thermal behavior has to be considered in the design phase. This can be done with thermal and electro-thermal design and simulation tools. This Special Issue of *Energies*, edited by two well-known experts of the field, Prof. Marta Rencz, Budapest University of Technology and Economics, and by Prof. Lorenzo Codecasa, Politecnico di Milano, collects twelve papers carefully selected for the representation of the latest results in thermal and electro-thermal system simulation. These contributions present a good survey of the latest results in one of the most topical areas in the field of electronics: The thermal and electro-thermal simulation of electronic components and systems. Several papers of this issue are extended versions of papers presented at the THERMINIC 2018 Workshop, held in Stockholm in the fall of 2018. The papers presented here deal with modeling and simulation of state-of-the-art applications that are highly critical from the thermal point of view, and around which there is great research activity in both industry and academia. Contributions covered the thermal simulation of electronic packages, electro-thermal advanced modeling in power electronics, multi-physics modeling and simulation of LEDs, and the characterization of interface materials, among other subjects.

Innovative Numerical Modelling in Geomechanics Luis Ribeiro e Sousa 2012-05-03 Since the 1990s five books on Applications of Computational Mechanics in Geotechnical Engineering have been published. *Innovative Numerical Modelling in Geomechanics* is the 6th and final book in this series, and contains papers written by leading experts on computational mechanics. The book treats highly relevant topics in the field of geotechnical

Learning and Performance Assessment: Concepts, Methodologies, Tools, and Applications Management Association, Information Resources 2019-10-11 As teaching strategies continue to change and evolve, and technology use in classrooms continues to increase, it is imperative that their impact on student learning is monitored and assessed. New practices are being developed to enhance students' participation, especially in their own assessment, be it through peer-review, reflective assessment, the introduction of new technologies, or other novel solutions. Educators must remain up-to-date on the latest methods of evaluation and performance measurement techniques to ensure that their students excel. *Learning and Performance Assessment: Concepts, Methodologies, Tools, and Applications* is a vital reference source that examines emerging perspectives on the theoretical and practical aspects of learning and performance-based assessment techniques and applications within educational settings. Highlighting a range of topics such as learning outcomes, assessment design, and peer assessment, this multi-volume book is ideally designed for educators, administrative officials, principals, deans, instructional designers, school boards, academicians, researchers, and education students seeking coverage on an educator's role in evaluation design and analyses of evaluation methods and outcomes.

International Workshop on Finite Elements for Microwave Engineering Roberto D. Graglia 2016-05-09 When Courant prepared the text of his 1942 address to the American Mathematical Society for publication, he added a two-page Appendix to illustrate how the variational methods first described by Lord Rayleigh could be put to wider use in potential theory. Choosing piecewise-linear approximants on a set of triangles which he called elements, he dashed off a couple of two-dimensional examples and the finite element method was born. Finite element activity in electrical engineering began in earnest about 1968-1969. A paper on waveguide analysis was published in *Alta Frequenza* in early 1969, giving the details of a finite element formulation of the classical hollow waveguide problem. It was followed by a rapid succession of papers on magnetic fields in saturable materials, dielectric loaded waveguides, and other well-known boundary value problems of electromagnetics. In the decade of the eighties, finite element methods spread quickly. In several technical areas, they assumed a dominant role in field problems. P.P. Silvester, San Miniato (PI), Italy, 1992 Early in the nineties the International Workshop on Finite Elements for Microwave Engineering started. This volume contains the history of the Workshop and the Proceedings of the 13th edition, Florence (Italy), 2016. The 14th Workshop will be in Cartagena (Colombia), 2018.

Data Intensive Distributed Computing: Challenges and Solutions for Large-scale Information Management Kosar, Tefvik 2012-01-31 "This book focuses on the challenges of distributed systems imposed by the data intensive applications, and on the different state-of-the-art solutions proposed to overcome these challenges"--Provided by publisher.

The First Sourcebook on Nordic Research in Mathematics Education Bharath Sriraman 2010-09-01 *The First Sourcebook on Nordic Research in Mathematics Education: Norway, Sweden, Iceland, Denmark and contributions from Finland* provides the first comprehensive and unified treatment of historical and contemporary research trends in mathematics education in the Nordic world. The book is organized in sections co-ordinated by active researchers in mathematics education in Norway, Sweden, Iceland, Denmark, and Finland. The purpose of this sourcebook is to synthesize and survey the established body of research in these countries with findings that have influenced ongoing research agendas, informed practice, framed curricula and policy. The sections for each country also include historical articles in addition to exemplary examples of recently conducted research oriented towards the future. The book will serve as a standard reference for mathematics education researchers, policy makers, practitioners and students both in and outside the Nordic countries.

Simulation in Computer Network Design and Modeling: Use and Analysis Al-Bahadili, Hussein 2012-02-29 "This book reviews methodologies in computer network simulation and modeling, illustrates the benefits of simulation in computer networks design, modeling, and analysis, and identifies the main issues that face efficient and effective computer network simulation"--Provided by publisher.

Thermodynamics, Kinetics, and Microphysics of Clouds Vitaly I. Khvorostyanov 2014-08-25 *Thermodynamics, Kinetics, and Microphysics of Clouds* presents a unified theoretical foundation that provides the basis for incorporating cloud microphysical processes in cloud and climate models. In particular, the book provides: • A theoretical basis for understanding the processes of cloud particle formation, evolution and precipitation, with emphasis on spectral cloud microphysics based on numerical and analytical solutions of the kinetic equations for the drop and crystal size spectra along with the supersaturation equation • The latest detailed theories and parameterizations of drop and crystal nucleation suitable for cloud and climate models derived from the general principles of thermodynamics and kinetics • A platform for advanced parameterization of clouds in weather prediction and climate models • The scientific foundation for weather and climate modification by cloud seeding. This book will be invaluable for researchers and advanced students engaged in cloud and aerosol physics, and air pollution and climate research.

Curriculum Models for the 21st Century Maree Gosper 2013-08-28 Changing student profiles and the increasing availability of mainstream and specialized learning technologies are stretching the traditional face-to-face models of teaching and learning in higher education. Institutions, too, are facing far-reaching systemic changes which are placing strains on existing resources and physical infrastructure and calling into question traditional ways of teaching through lectures and tutorials. And, with an ever-increasing scrutiny on teaching and teachers' accountability for positive educational outcomes, the call for closer attention to learning, teaching and, most especially, to the design and delivery of the curriculum is given increasing relevance and importance. Research provides strong evidence of the potential for technologies to facilitate not only cognition and learning but also to become integral components in the redesign of current curriculum models. Some Universities and individual academics have moved along this pathway, developing new and innovative curriculum, blending pedagogies and technologies to suit their circumstances. Yet, there are others, unsure of the possibilities, the opportunities and constraints in these changing times. *Curriculum Models for the 21st Century* gives insights into how teaching and learning can be done differently. The focus is on a whole of curriculum approach, looking at theoretical models and examples of practice which capitalize on the potential of technologies to deliver variations and alternatives to the more traditional lecture-based model of University teaching.?

VANET Hannes Hartenstein 2009-11-04 This book provides an invaluable introduction to inter-vehicular communications, demonstrating the networking and communication technologies for reducing fatalities, improving transportation efficiency, and minimising environmental impact. This book addresses the applications and technical aspects of radio-based vehicle-to-vehicle and vehicle-to-infrastructure communication that can be established by short- and medium range communication based on wireless local area network technology (primarily IEEE 802.11). It contains a coherent treatment of the important topics and technologies contributed by leading experts in the field, covering the potential applications for and their requirements on the communications system. The authors cover physical and medium access control layer issues with focus on IEEE 802.11-based systems, and show how many of the applications benefit when information is efficiently disseminated, and the techniques that provide attractive data aggregation (also includes design of the corresponding middleware). The book also considers issues such as IT-security (means and fundamental trade-off between security and privacy), current standardization activities such as IEEE 802.11p, and the IEEE 1609 standard series. Key Features: Covers the state-of-the-art in the field of vehicular inter-networks such as safety and efficiency applications, physical and medium access control layer issues, middleware, and security Shows how vehicular

networks differ from other mobile networks and illustrates the idea of vehicle-to-vehicle communications with application scenarios and with current proofs of concept worldwide Addresses current standardization activities such as IEEE 802.11p and the IEEE 1609 standard series Offers a chapter on mobility models and their use for simulation of vehicular inter-networks Provides a coherent treatment of the important topics and technologies contributed by leading academic and industry experts in the field This book provides a reference for professional automotive technologists (OEMs and suppliers), professionals in the area of Intelligent Transportation Systems, and researchers attracted to the field of wireless vehicular communications. Third and fourth year undergraduate and graduate students will also find this book of interest. For additional information please visit <http://www.vanetbook.com>

Energy and Water Development Appropriations For 2006, Part 4B, 109-1 Hearings, *. 2005

Understanding Social Networks Charles Kadushin 2012-01-19 Understanding Social Networks explains the big ideas that underlie social networks, covering fundamental concepts then discussing networks and their core themes in increasing order of complexity.

Service-Oriented Computing Samik Basu 2013-11-27 This book constitutes the refereed proceedings of the 11th International Conference on Service-Oriented Computing, ICSOC 2012, held in Berlin, Germany, in December 2013. The 29 full papers and 27 short papers presented were carefully reviewed and selected from 205 submissions. The papers are organized in topical sections on service engineering, service operations and management; services in the cloud; and service applications and implementations.

Finnish Innovations and Technologies in Schools Hannele Niemi 2014-11-27 This book combines several perspectives on the steps the Finnish educational system has taken to provide students with the skills and competences needed for living in today's society and in the future. The ecosystem is used as a metaphor for the educational system. The Finnish system aims to achieve sustainable education by ensuring that the system is simultaneously interconnected and open to transformations. The book describes how a flexible curriculum system is succeeding without the pressures of high-stake testing. It also illustrates how the ongoing curriculum reform of the basic education is working. The book brings together knowledge gained in schools through the cooperation of researchers, teachers, school principals, the public sector, and private companies. The book presents case studies of technology integration aimed at crossing boundaries in formal and informal learning settings, locally and globally. The contributors address 21st-century needs and requirements through learner-driven knowledge creation, collaboration, networking, and digital literacies. It opens new scenarios of how to apply digital storytelling and games connecting fun, motivation, and learning. The strong message is that, through collaboration and networking, we can create an educational ecosystem that supports different learners.

Strengthening High School Chemistry Education Through Teacher Outreach Programs National Research Council 2009-06-15 A strong chemical workforce in the United States will be essential to the ability to address many issues of societal concern in the future, including demand for renewable energy, more advanced materials, and more sophisticated pharmaceuticals. High school chemistry teachers have a critical role to play in engaging and supporting the chemical workforce of the future, but they must be sufficiently knowledgeable and skilled to produce the levels of scientific literacy that students need to succeed. To identify key leverage points for improving high school chemistry education, the National Academies' Chemical Sciences Roundtable held a public workshop, summarized in this volume, that brought together representatives from government, industry, academia, scientific societies, and foundations involved in outreach programs for high school chemistry teachers. Presentations at the workshop, which was held in August 2008, addressed the current status of high school chemistry education; provided examples of public and private outreach programs for high school chemistry teachers; and explored ways to evaluate the success of these outreach programs.

2006 Physics Education Research Conference Laura McCullough 2007-03-05 Syracuse, New York, 26–27 July 2006

Handbook of Research on Building Information Modeling and Construction Informatics: Concepts and Technologies Underwood, Jason 2009-12-31 In recent years, building information modeling has become a very active research area of construction informatics with investigation of ICT use within construction industry processes and organizations. The Handbook of Research on Building Information Modeling and Construction Informatics: Concepts and Technologies addresses the problems related to information integration and interoperability throughout the lifecycle of a building, from feasibility and conceptual design through to demolition and recycling stages. Containing research from leading international experts, this Handbook of Research provides comprehensive coverage and definitions of the most important issues, concepts, trends, and technologies within the field.

Physics Teaching and Learning Dennis W. Sunal 2019-05-01 Physics Teaching and Learning: Challenging the Paradigm, RISE Volume 8, focuses on research contributions challenging the basic assumptions, ways of thinking, and practices commonly accepted in physics education. Teaching physics involves multifaceted, research-based, value added strategies designed to improve academic engagement and depth of learning. In this volume, researchers, teaching and curriculum reformers, and reform implementers discuss a range of important issues. The volume should be considered as a first step in thinking through what physics teaching and physics learning might address in teacher preparation programs, in-service professional development programs, and in classrooms. To facilitate thinking about research-based physics teaching and learning each chapter in the volume was organized around five common elements: 1. A significant review of research in the issue or problem area. 2. Themes addressed are relevant for the teaching and learning of K-16 science 3. Discussion of original research by the author(s) addressing the major theme of the chapter. 4. Bridge gaps between theory and practice and/or research and practice. 5. Concerns and needs are addressed of school/community context stakeholders including students, teachers, parents, administrators, and community members.

Handbook of Educational Data Mining Cristobal Romero 2010-10-25 Handbook of Educational Data Mining (EDM) provides a thorough overview of the current state of knowledge in this area. The first part of the book includes nine surveys and tutorials on the principal data mining techniques that have been applied in education. The second part presents a set of 25 case studies that give a rich overview of the problems that EDM has addressed. Researchers at the Forefront of the Field Discuss Essential Topics and the Latest Advances With contributions by well-known researchers from a variety of fields, the book reflects the multidisciplinary nature of the EDM community. It brings the educational and data mining communities together, helping education experts understand what types of questions EDM can address and helping data miners understand what types of questions are important to educational design and educational decision making. Encouraging readers to integrate EDM into their research and practice, this timely handbook offers a broad, accessible treatment of essential EDM techniques and applications. It provides an excellent first step for newcomers to the EDM community and for active researchers to keep abreast of recent developments in the field.

Active Learning: Theoretical Perspectives, Empirical Studies and Design Profiles Robert Cassidy 2019-07-11 This book represents the emerging efforts of a growing international network of researchers and practitioners to promote the development and uptake of evidence-based pedagogies in higher education, at something a level approaching large-scale impact. By offering a communication venue that attracts and enhances much needed partnerships among practitioners and researchers in pedagogical innovation, we aim to change the conversation and focus on how we work and learn together – i.e. extending the implementation and knowledge of co–design methods. In this first edition of our Research Topic on Active Learning, we highlight two (of the three) types of publications we wish to promote. First are studies aimed at understanding the pedagogical designs developed by practitioners in their own practices by bringing to bear the theoretical lenses developed and tested in the education research community. These types of studies constitute the "practice pull" that we see as a necessary counterbalance to "knowledge push" in a more productive pedagogical innovation ecosystem based on research-practitioner partnerships. Second are studies empirically examining the implementations of evidence-based designs in naturalistic settings and under naturalistic conditions. Interestingly, the teams conducting these studies are already exemplars of partnerships between researchers and practitioners who are uniquely positioned as "in-betweens" straddling the two worlds. As a result, these publications represent both the rigours of research and the pragmatism of reflective practice. In forthcoming editions, we will add to this collection a third type of publication -- design profiles. These will present practitioner-developed pedagogical designs at varying levels of abstraction to be held to scrutiny amongst practitioners, instructional designers and researchers alike. We hope by bringing these types of studies together in an open access format that we may contribute to the development of new forms of practitioner-researcher interactions that promote co-design in pedagogical innovation.

Solar and Space Physics National Research Council 2013-09-26 From the interior of the Sun, to the upper atmosphere and near-space environment of Earth, and outward to a region far beyond Pluto where the Sun's influence wanes, advances during the past decade in space physics and solar physics--the disciplines NASA refers to as heliophysics--have yielded spectacular insights into the phenomena that affect our home in space. Solar and Space Physics, from the National Research Council's (NRC's) Committee for a Decadal Strategy in Solar and Space Physics, is the second NRC decadal survey in heliophysics. Building on the research accomplishments realized during the past decade, the report presents a program of basic and applied research for the period 2013-2022 that will improve scientific understanding of the mechanisms that drive the Sun's activity and the fundamental physical processes underlying near-Earth plasma dynamics, determine the physical interactions of Earth's atmospheric layers in the context of the connected Sun-Earth

system, and enhance greatly the capability to provide realistic and specific forecasts of Earth's space environment that will better serve the needs of society. Although the recommended program is directed primarily at NASA and the National Science Foundation for action, the report also recommends actions by other federal agencies, especially the parts of the National Oceanic and Atmospheric Administration charged with the day-to-day (operational) forecast of space weather. In addition to the recommendations included in this summary, related recommendations are presented in this report.

Air Pollution Modeling and its Application XX Douw G. Steyn 2010-03-10 Recent developments in air pollution modelling are explored as a series of contributions from researchers at the forefront of their field. This book on air pollution modelling and its application is focused on local, urban, regional and intercontinental modelling; data assimilation and air quality forecasting; model assessment and evaluation; aerosol transformation; the relationship between air quality and human health and the effects of climate change on air quality. It consists of a series of papers that were presented at the 30th NATO/SPS International Technical Meeting on Air Pollution Modelling and its Application held in San Francisco, U.S.A., May 18-22, 2009. It is intended as reference material for students and professors interested in air pollution modelling at the graduate level as well as researchers and professionals involved in developing and utilizing air pollution models.

Technologies for E-Learning and Digital Entertainment Kin-chuen Hui 2007-07-17 This book constitutes the refereed proceedings of the Second International Conference on E-learning and Games, Edutainment 2007, held in Hong Kong, China, in June 2007. It covers virtual and augmented reality in game and education, virtual characters in games and education, e-learning platforms and tools, geometry in games and virtual reality, vision, imaging and video technology, as well as collaborative and distributed environments.

Handbook of Software Solutions for ICME Georg J. Schmitz 2016-10-31 As one of the results of an ambitious project, this handbook provides a well-structured directory of globally available software tools in the area of Integrated Computational Materials Engineering (ICME). The compilation covers models, software tools, and numerical methods allowing describing electronic, atomistic, and mesoscopic phenomena, which in their combination determine the microstructure and the properties of materials. It reaches out to simulations of component manufacture comprising primary shaping, forming, joining, coating, heat treatment, and machining processes. Models and tools addressing the in-service behavior like fatigue, corrosion, and eventually recycling complete the compilation. An introductory overview is provided for each of these different modelling areas highlighting the relevant phenomena and also discussing the current state for the different simulation approaches. A must-have for researchers, application engineers, and simulation software providers seeking a holistic overview about the current state of the art in a huge variety of modelling topics. This handbook equally serves as a reference manual for academic and commercial software developers and providers, for industrial users of simulation software, and for decision makers seeking to optimize their production by simulations. In view of its sound introductions into the different fields of materials physics, materials chemistry, materials engineering and materials processing it also serves as a tutorial for students in the emerging discipline of ICME, which requires a broad view on things and at least a basic education in adjacent fields.