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This book covers a range of topics including selective technologies and algorithms that can potentially contribute to developing an intelligent environment and smarter cities. While the connectivity and efficiency of smart cities is important, the analysis of the impact of construction development and large projects in the city is crucial to decision and policy makers, before the project is approved. This book also presents an agenda for future investigations to address the need for advanced tools such as mobile scanners, Geospatial Artificial Intelligence, Unmanned Aerial Vehicles, Geospatial Augmented Reality apps, Light Detection, and Ranging in smart cities. Some of selected specific tools presented in this book are as a simulator for improving the smart parking practices by modelling drivers with activity plans, a bike optimization algorithm to increase the efficiency of bike stations, an agent-based model simulation of human mobility with the use of mobile phone datasets. In addition, this book describes the use of numerical methods to match the network demand and supply of bicycles, investigate the distribution of railways using different indicators, presents a novel algorithm of direction-aware continuous moving K-nearest neighbor queries in road networks, and presents an efficient staged evacuation planning algorithm for multi-exit buildings.

The papers presented at Building Information Modelling 2017 (BIM) are from a range of forums, including plenary papers, workshops, seminars, and panel sessions. The conference was attended by experts from industry, practice and academia, sharing their work on key topics, the development of innovative solutions, and the identification future trends. The volume gives details of how BIM tools and techniques have fundamentally altered the manner in which modern construction teams operate, the processes through which designs are evolved, and the relationships between conceptual, detail, construction and life cycle stages. BIM is essentially value-creating collaboration throughout the entire life-cycle of an asset, underpinned by the statistics attached to them and has far and reaching consequences on both building procurement and infrastructure. BIM 2017 papers cover topics such as: BIM in design coordination, Construction operations; Building operation and maintenance; BIM and sustainability; Collaborative working and practices; Facilities management integration and GIS integration; Automation in construction; Health and safety; BIM and interoperability; Life cycle project management; Cultural heritage; BIM and Robotics; Risk analysis and management and Emergency analysis, planning and management

Since 1994, the European Conference on Product and Process Modelling (www.ecppm.org) has been providing a review of research, development and industrial implementation of product and process model technology in construction. The 7th European Conference on Product and Process Modelling (ECPPM 2008) provided a unique discussion platform for topics of

We are on the verge of what many are calling the "second information revolution," based on ubiquitous access to both computing and information. The technologies of instant access have potential to transform dramatically our lives. This book contains chapters by leading international experts. They discuss issues surrounding the impact of instant access on cities, daily lives, transportation, privacy, social and economic networks, community and education.

This is the proceedings of the XVI International Congress of Graphic Design in Architecture, EGA 2016, held in Alcalá de Henares, Spain, in June 2016. About 200 professionals and researchers from 18 different countries attended the Congress. This book will be of interest to researchers in the field of architecture and Engineering. Topics discussed are Innovations in Architecture, graphic design and architecture, history and heritage among others.

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This volume spans a wide range of technical disciplines and technologies, including complex systems, biomedical engineering, electrical engineering, energy, telecommunications, mechanical engineering, civil engineering, and computer science. The papers included in this volume were presented at the International Symposium on Innovative and Interdisciplinary Applications of Advanced Technologies (IAT), held in Neum, Bosnia and Herzegovina on June 26 and 27, 2016. This highly interdisciplinary volume is devoted to various aspects and types of systems. Systems thinking is crucial for successfully building and understanding man-made, natural, and social systems.

This essential book introduces the concept of nD modelling, which takes the theory of computer modelling of the built environment to n dimensions. nD modelling utilizes a decision support tool for systematic assessment and comparison between various design parameters such as cost, accessibility, maintainability, sustainability, crime, energy, whole life costing, acoustics and scheduling among others.

Constructing the Future is a comprehensive book which provides a global perspective on the concept of nD modelling and examines its impact on construction, from development to application. The text offers a critique of competing views that seek to justify (or ignore) the role of nD modelling in the future of construction as well as describing developments in this area which are already happening worldwide.

Presenting a thorough critique of competing views as well as providing guidance on best practice, Constructing the Future is a bold, well-grounded and illustrated title introducing construction management professionals and researchers to this exciting new development in the quest for a single building and product model.

Technological evolutions have changed the field of architecture exponentially, leading to more stable and energy-efficient building structures. Architects and engineers must be prepared to further enhance their knowledge in the field in order to effectively meet new and advancing standards. Architecture and Design: Breakthroughs in Research and Practice is an authoritative resource for the latest research on the application of new technologies and digital tools that revolutionize the work of architects globally, aiding in architectural design, planning, implementation, and restoration. Highlighting a range of pertinent topics such as design anthropology, digital preservation, and 3D modeling, this publication is an ideal reference source for researchers, scholars, IT professionals, engineers, architects, contractors, and academicians seeking current research on the development and creation of architectural design.

In many countries, the development of railway science is of great significance to both the economy and society, and transdisciplinary studies involving railways and other fields has also become more important in recent years. This book presents the proceedings of the 7th International Symposium on Innovation & Sustainability of Modern Railway (ISMR 2020), held in Nanchang, China from 23 - 25 October 2020. The symposium has been held biennially since 2008 and is principally aimed at expanding the scientific partnership between Russian and Chinese transport universities in the field of railway transportation. It is organized in a collaboration between the Federal Railway Transport Agency, Irkutsk State Transport University (IrGUPS) and East China Jiaotong University, and enables scientists from Russia, China and Mongolia to come together to discuss breakthrough technologies, as well as the problems of innovation in the secure operation of modern railways. Despite the disruption caused by the global pandemic, 89 submissions were received for the 2020 edition, 38 of which were selected after review for presentation and publication here. These comprise 12 papers dealing with railways and mechanics, 20 covering railways and computer sciences, and 6 related to railways and management, together with the 2 contributions of the invited keynote speakers (professor Xiaoyan Lei, principle of East China Jiaotong University, and professor Erol Guler from George Mason University). The book provides an insight into new ideas and developments in the industry, and will be of interest to all railway practitioners.

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Building Information Modeling (BIM) refers to the consistent and continuous use of digital information throughout the entire lifecycle of a built facility, including its design, construction and operation. In order to exploit BIM methods to their full potential, a fundamental grasp of their key principles and applications is essential. Accordingly, this book combines discussions of theoretical foundations with reports from the industry on currently applied best practices. The book's content is divided into six parts: Part I discusses the technological basics of BIM and addresses computational methods for the geometric and semantic modeling of buildings, as well as methods for process modeling. Next, Part II covers the important aspect of the interoperability of BIM software products and describes in detail the standardized data format Industry Foundation Classes. It presents the different classification systems, discusses the data format CityGML for describing 3D city models and COBie for handing over data to clients, and also provides an overview of BIM programming tools and interfaces. Part III is dedicated to the philosophy, organization and technical implementation of BIM-based collaboration, and discusses the impact on legal issues including construction contracts. In turn, Part IV covers a wide range of BIM use cases in the different lifecycle phases of a built facility, including the use of BIM for design coordination, structural analysis, energy analysis, code compliance checking, quantity take-off, prefabrication, progress monitoring and operation. In Part V, a number of design and construction companies report on the current state of BIM adoption in connection with actual BIM projects, and discuss the approach pursued for the shift toward BIM, including the hurdles taken. Lastly, Part VI summarizes the book's content and provides an outlook on future developments. The book was written both for professionals using or programming such tools, and for students in Architecture and Construction Engineering programs.

This open access book provides insight into the implementation of Life Cycle approaches along the entire business value chain, supporting environmental, social and economic sustainability related to the development of industrial technologies, products, services and policies; and the development and management of smart agricultural systems, smart mobility systems, urban infrastructures and energy for the built environment. The book is based on papers presented at the 8th International Life Cycle Management Conference that took place from September 3-6, 2017 in Luxembourg, and which was organized by the Luxembourg Institute of Science and Technology (LIST) and the University of Luxembourg in the framework of the LCM Conference Series.

These proceedings address the latest developments in information communication and technologies for geo-engineering. The 3rd International Conference on Information Technology in Geo-Engineering (ICITG 2019), held in Guimarães, Portugal, follows the previous successful installments of this conference series in Durham (2014) and Shanghai (2010). The respective chapters cover the following: Use of information and communications technologies Big data and

databases Data mining and data science Imaging technologies Building information modelling applied to geo-structures Artificial intelligence Smart geomaterials and intelligent construction Sensors and monitoring Asset management Case studies on design, construction and maintenance Given its broad range of coverage, the book will benefit students, educators, researchers and professional practitioners alike, encouraging these readers to help take the geo-engineering community into the digital age

Throughout the 38 chapters, this must-have volume outlines essential information about the implementation of emerging technologies, from building information modeling and 3D printing, to life cycle assessment and information technology in construction and engineering projects. It covers practical case studies to demonstrate the implementation of emerging technologies in a compact style, ensuring that practitioners can adopt these methods to realize immediate benefits in productivity, safety and performance improvement.

During the last decade developments in 3D Geoinformation have made substantial progress. We are about to have a more complete spatial model and understanding of our planet in different scales. Hence, various communities and cities offer 3D landscape and city models as valuable source and instrument for sustainable management of rural and urban resources. Also municipal utilities, real estate companies etc. benefit from recent developments related to 3D applications. To meet the challenges due to the newest changes academics and practitioners met at the 5th International Workshop on 3D Geoinformation in order to present recent developments and to discuss future trends. This book comprises a selection of evaluated, high quality papers that were presented at this workshop in November 2010. The topics focus explicitly on the last achievements (methods, algorithms, models, systems) with respect to 3D geoinformation requirements. The book is aimed at decision makers and experts as well at students interested in the 3D component of geographical information science including GI engineers, computer scientists, photogrammetrists, land surveyors, urban planners, and mapping specialists.

Life-Cycle Civil Engineering: Innovation, Theory and Practice contains the lectures and papers presented at IALCCE2020, the Seventh International Symposium on Life-Cycle Civil Engineering, held in Shanghai, China, October 27-30, 2020. It consists of a book of extended abstracts and a multimedia device containing the full papers of 230 contributions, including the Fazlur R. Khan lecture, eight keynote lectures, and 221 technical papers from all over the world. All major aspects of life-cycle engineering are addressed, with special emphasis on life-cycle design, assessment, maintenance and management of structures and infrastructure systems under various deterioration mechanisms due to various environmental hazards. It is expected that the proceedings of IALCCE2020 will serve as a valuable reference to anyone interested in life-cycle of civil infrastructure systems, including students, researchers, engineers and practitioners

from all areas of engineering and industry.

This book gathers the latest advances, innovations, and applications in the field of information technology in civil and building engineering, presented at the 18th International Conference on Computing in Civil and Building Engineering (ICCCBE), São Paulo, Brazil, August 18-20, 2020. It covers highly diverse topics such as BIM, construction information modeling, knowledge management, GIS, GPS, laser scanning, sensors, monitoring, VR/AR, computer-aided construction, product and process modeling, big data and IoT, cooperative design, mobile computing, simulation, structural health monitoring, computer-aided structural control and analysis, ICT in geotechnical engineering, computational mechanics, asset management, maintenance, urban planning, facility management, and smart cities. Written by leading researchers and engineers, and selected by means of a rigorous international peer-review process, the contributions highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaborations.

Meet the challenge of integrating Building Information Modeling and sustainability with this in-depth guide, which pairs these two revolutionary movements to create environmentally friendly design through a streamlined process. Written by an award-winning team that has gone beyond theory to lead the implementation of Green BIM projects, this comprehensive reference features practical strategies, techniques, and real-world expertise so that you can create sustainable BIM projects, no matter what their scale.

In the last two decades, the biannual ECPPM (European Conference on Product and Process Modelling) conference series has provided a unique platform for the presentation and discussion of the most recent advances with regard to the ICT (Information and Communication Technology) applications in the AEC/FM (Architecture, Engineering, Construction and Facilities Management) domains. ECPPM 2014, the 10th European Conference on Product and Process Modelling, was hosted by the Department of Building Physics and Building Ecology of the Vienna University of Technology, Austria (17-19 September 2014). This book entails a substantial number of high-quality contributions that cover a large spectrum of topics pertaining to ICT deployment instances in AEC/FM, including: - BIM (Building Information Modelling) - ICT in Civil engineering & Infrastructure - Human requirements & factors - Computational decision support - Commissioning, monitoring & occupancy - Energy & management - Ontology, data models, and IFC (Industry Foundation Classes) - Energy modelling - Thermal performance simulation - Sustainable buildings - Micro climate modelling - Model calibration - Project & construction management - Data & information management As such, eWork and eBusiness in Architecture, Engineering and Construction 2014 represents a rich and comprehensive resource for academics and professionals working in the interdisciplinary areas of information technology applications in architecture, engineering, and construction.

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This book focuses on how to maintain environmental sustainability as one of its main principles, and it addresses how smart cities serve to diminish wastes and maintain natural resources by having clean green energy that is operated by new smart technology designs. Living in a smart city is not something of the future anymore, it is here, and it is being implemented all over the world. A smart city uses different types of electronic Internet of things (IoT) sensors to collect data and then use these data to manage assets and resources efficiently. The smart city concept integrates information and communication technology (ICT), and various physical devices connected to the IoT network to optimize the efficiency of city operations and services and achieve sustainable solutions to allow us to grow with proper management of our resources. Smart sustainable structures and infrastructures face the need of urban areas due to the growth of populations while in the same time save our environment. To achieve this, we need to revisit the conventional methods in design and construction and the conventional materials which are used now to optimize the design and provide smart solutions. In the past few years, the consumption of resources has been massive, and the waste produced from that consumption has been inconceivable. This is causing environmental degradation, which produces many environmental challenges, such as global climate change, excessive fossil fuel dependency and the growing demand for energy. As well as, discussing the challenges facing the civil engineering design and construction of smart cities components and presenting concepts and insight from experts and researchers from different civil engineering disciplines., this book explains how to construct buildings and special structures and how to manage and monitor energy.

Additive Manufacturing and 3D Printing Technology: Principles and Applications consists of the construction and working details of all modern additive manufacturing and 3D-printing technology processes and machines, while also including the fundamentals, for a well-rounded educational experience. The book is written to help the reader understand the fundamentals of the systems. This book provides a selection of additive manufacturing techniques suitable for near-term application with enough technical background to understand the domain, its applicability, and to consider variations to suit technical and organizational constraints. It highlights new innovative 3D-printing systems, presents a view of 4D printing, and promotes a vision of additive manufacturing and applications toward modern manufacturing engineering practices. With the block diagrams, self-explanatory figures, chapter exercises, and photographs of lab-developed prototypes, along with case studies, this new textbook will be useful to students studying courses in Mechanical, Production, Design, Mechatronics, and Electrical Engineering.

The efficient usage, investigation, and promotion of new methods, tools, and technologies within the field of architecture, particularly in urban planning and design, is becoming more critical as innovation holds the key to cities becoming smarter and ultimately more sustainable. In response to this need, strategies that can potentially yield more realistic results are continually being sought. The Handbook of Research on Digital Research Methods and Architectural Tools in Urban Planning and Design is a critical reference source that comprehensively covers the concepts and processes of more than 20 new methods in both planning and design in the field of architecture and aims to explain the ways for researchers to apply these methods in their works. Pairing innovative approaches alongside traditional research methods, the physical dimensions of traditional and new cities are addressed

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in addition to the non-physical aspects and applied models that are currently under development in new settlements such as sustainable cities, smart cities, creative cities, and intercultural cities. Featuring a wide range of topics such as built environment, urban morphology, and city information modeling, this book is essential for researchers, academicians, professionals, technology developers, architects, engineers, and policymakers.

This volume presents selected papers presented during the 4th International Conference on Transportation Geotechnics. The papers address the geotechnical challenges in design, construction, maintenance, monitoring, and upgrading of roads, railways, airfields, and harbor facilities and other ground transportation infrastructure with the goal of providing safe, economic, environmental, reliable and sustainable infrastructures. This volume will be of interest to postgraduate students, academics, researchers, and consultants working in the field of civil and transport infrastructure.

Thesis (Ph.D.)--Delft University of Technology, 2004.

The use of secondary data for research can offer benefits, particularly when limited resources are available for conducting research using primary methods. Researchers and students at both undergraduate and postgraduate levels, including their academic instructors, are increasingly recognising the immense opportunities in applying secondary research methods in built environment research. Advances in technology has also led to vast amounts of existing datasets that can be utilized for secondary research. This textbook provides a systematic guide on how to apply secondary research methods in the built environment, including their various underpinning methodologies. It provides guidance on the secondary research process, benefits, and drawbacks of applying secondary research methods, how to source for secondary data, ethical considerations, and the various secondary research methods that can be applied in built environment research. The book incorporates chapters dealing with qualitative secondary analysis, systematic literature reviews, legal analysis, bibliometric and scientometric analysis, literature-based discovery, and meta-analysis. Secondary Research Methods in the Built Environment is an ideal research book for undergraduate and postgraduate students in construction management, construction project management, quantity surveying, construction law and dispute resolution, real estate and property management, building services engineering, architecture, and civil engineering.

The definitive guide to architectural practice Business, legal, and technical trends in architecture are constantly changing. The Architect's Handbook of Professional Practice has offered firms the latest guidance on those trends since 1920. The Fifteenth Edition of this indispensable guide features nearly two-thirds new content and covers all aspects of contemporary practice, including updated material on: Small-firm practice, use of technologies such as BIM, and project delivery methods, such as IPD and architect-led design-build Career development and licensure for emerging professionals and state-mandated continuing education for established architects Business management topics, such as organizational development, marketing, finance, and human resources Research as an integrated aspect of architectural practice, featuring such topics as evidence-based design and research in a small-firm context The Fifteenth Edition of The Architect's Handbook of Professional Practice includes access to a website

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that contains samples of all AIA Contract Documents (in PDF format for Mac and PC computers). With comprehensive coverage of contemporary practices in architecture, as well as the latest developments and trends in the industry, The Architect's Handbook of Professional Practice continues to be the essential reference for every architect who must meet the challenges of today's marketplace with insight and confidence.

Green and Intelligent Technologies for Sustainable and Smart Asphalt Pavements contains 124 papers from 14 different countries which were presented at the 5th International Symposium on Frontiers of Road and Airport Engineering (IFRAE 2021, Delft, the Netherlands, 12-14 July 2021). The contributions focus on research in the areas of "Circular, Sustainable and Smart Airport and Highway Pavement" and collect the state-of-the-art and state-of-practice areas of long-life and circular materials for sustainable, cost-effective smart airport and highway pavement design and construction. The main areas covered by the book include: • Green and sustainable pavement materials • Recycling technology • Warm & cold mix asphalt materials • Functional pavement design • Self-healing pavement materials • Eco-efficiency pavement materials • Pavement preservation, maintenance and rehabilitation • Smart pavement materials and structures • Safety technology for smart roads • Pavement monitoring and big data analysis • Role of transportation engineering in future pavements Green and Intelligent Technologies for Sustainable and Smart Asphalt Pavements aims at researchers, practitioners, and administrators interested in new materials and innovative technologies for achieving sustainable and renewable pavement materials and design methods, and for those involved or working in the broader field of pavement engineering.

Technological revolutions have changed the field of architecture exponentially. The advent of new technologies and digital tools will continue to advance the work of architects globally, aiding in architectural design, planning, implementation, and restoration. The Handbook of Research on Emerging Digital Tools for Architectural Surveying, Modeling, and Representation presents expansive coverage on the latest trends and digital solutions being applied to architectural heritage. Spanning two volumes of research-based content, this publication is an all-encompassing reference source for scholars, IT professionals, engineers, architects, and business managers interested in current methodologies, concepts, and instruments being used in the field of architecture.

Natural and human activities change the environment we are living in and consequently impact the quality of life. Analysing these dynamics leads to a better understanding of urban change and facilitates urban development. Research related to the management of urban data has a long tradition. Through the years a variety of challenging research questions has been investigated related to the collection, storage, use and visualisation of the data representing the urban phenomena in a computer-based environment. The Urban Data Management Symposium (UDMS) focuses on these issues since 1971. UDMS aims at providing a forum to discuss urban planning processes, exchange ideas, share information on available technology and demonstrate and promote successful information systems in local government.

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The focus is on urban, regional and rural issues. The UDMS 2009 annual addresses the following themes: 3D modelling, Spatial Data Infrastructures and databases, Risk and Disaster management, Environmental planning, analysis and e-government and Traffic and road monitoring. The book will be a useful source of information for urban data-related professionals, such as scholars, GIS engineers, geomatic professionals, photogrammetrists, land surveyors, mapping specialists, urban planners and researchers, as well as for postgraduate students and lecturers.

Data Science for COVID-19, Volume 2: Societal and Medical Perspectives presents the most current and leading-edge research into the applications of a variety of data science techniques for the detection, mitigation, treatment and elimination of the COVID-19 virus. At this point, Cognitive Data Science is the most powerful tool for researchers to fight COVID-19. Thanks to instant data-analysis and predictive techniques, including Artificial Intelligence, Machine Learning, Deep Learning, Data Mining, and computational modeling for processing large amounts of data, recognizing patterns, modeling new techniques, and improving both research and treatment outcomes is now possible. Provides a leading-edge survey of Data Science techniques and methods for research, mitigation and the treatment of the COVID-19 virus Integrates various Data Science techniques to provide a resource for COVID-19 researchers and clinicians around the world, including the wide variety of impacts the virus is having on societies and medical practice Presents insights into innovative, data-oriented modeling and predictive techniques from COVID-19 researchers around the world, including geoprocessing and tracking, lab data analysis, and theoretical views on a variety of technical applications Includes real-world feedback and user experiences from physicians and medical staff from around the world for medical treatment perspectives, public safety policies and impacts, sociological and psychological perspectives, the effects of COVID-19 in agriculture, economies, and education, and insights on future pandemics

Spatial technologies like GIS, CAD, and spatial DBMS have proved their applicability and usability in almost every sector of urban development. Urban Planning Systems, Public Participation Systems, and others have been continuously developed and improved contributing to better decision making, communicating ideas between different actors as well as Building Information Modelling (BIM) in Design, Construction, and Operations contains the proceedings of the first in a planned series of conferences dealing with design coordination, construction, maintenance, operation and decommissioning. The book gives details of how BIM tools and techniques have fundamentally altered the manner in which modern construction teams operate, the processes through which designs are evolved, and the relationships between conceptual, detail, construction and life cycle stages. The papers contributed by experts from industry, practice and academia, debate key topics, develop innovative solutions, and predict future trends. The interdisciplinary nature of the contents and the collaborative practices discussed, so important within the built environment, will appeal to those

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engaged in design, surveying, visualisation, infrastructure, real estate, construction law, insurance, and facilities management. Topics covered include: BIM in design coordination; BIM in construction operations, BIM in building operation and maintenance; BIM and sustainability; BIM and collaborative working and practices; BIM health and safety and BIM-facilities management integration, among others.

This book contains 19 peer-reviewed papers on the subject of BIM in the construction industry. These articles cover recent advances in the development of BIM technologies and applications in the field of architecture, engineering, and construction (AEC) industry.

This double volume set (LNAI 10863-10864) constitutes the refereed proceedings of the 25th International Workshop, EG-ICE 2018, held in Lausanne, Switzerland, in June 2018. The 58 papers presented in this volume were carefully reviewed and selected from 108 submissions. The papers are organized in topical sections on Advanced Computing in Engineering, Computer Supported Construction Management, Life-Cycle Design Support, Monitoring and Control Algorithms in Engineering, and BIM and Engineering Ontologies.

Geographical Information Systems is a computer system used to capture, store, analyze and display information related to positions on the Earth's surface. It has the ability to show multiple types of information on multiple geographical locations in a single map, enabling users to assess patterns and relationships between different information points, a crucial component for multiple aspects of modern life and industry. This 3-volumes reference provides an up-to date account of this growing discipline through in-depth reviews authored by leading experts in the field. VOLUME EDITORS Thomas J. Cova The University of Utah, Salt Lake City, UT, United States Ming-Hsiang Tsou San Diego State University, San Diego, CA, United States Georg Bareth University of Cologne, Cologne, Germany Chunqiao Song University of California, Los Angeles, CA, United States Yan Song University of North Carolina at Chapel Hill, Chapel Hill, NC, United States Kai Cao National University of Singapore, Singapore Elisabete A. Silva University of Cambridge, Cambridge, United Kingdom Covers a rapidly expanding discipline, providing readers with a detailed overview of all aspects of geographic information systems, principles and applications Emphasizes the practical, socioeconomic applications of GIS Provides readers with a reliable, one-stop comprehensive guide, saving them time in searching for the information they need from different sources

At the beginning of the Fourth Industrial Revolution, the advent of digitalization, innovative technologies and materials, and new construction techniques have begun transforming the way that infrastructure, real estate, and other built assets can be designed, constructed, and operated in order to create a more attractive, energy-efficient, comfortable, affordable, safe, and sustainable built environment. Developments in materials and cutting-edge technologies (such as artificial

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intelligence, robotics, nanotechnology, 3D printing, and biotechnology) have finally started to move the construction towards a new era. Massive changes are occurring as a result of the possibilities created by big data and the Internet of Things, along with the technological advances that are driving down the cost of sensors, data storage, and computer services. Construction 4.0: Advanced Technology, Tools and Materials for the Digital Transformation of the Construction Industry presents a thorough review of developments in materials, emerging trends, cutting-edge technologies, and strategies in the fields of smart building design, construction, and operation, providing the reader with a comprehensive guideline on how to exploit the new possibilities offered by the digital revolution. It will be an essential reference resource for academic researchers, material scientists, and civil engineers, undergraduate and graduate students, and other professionals working in the fields of smart eco-efficient construction and cutting-edge technologies applied to construction. Features discussions on how nanomaterials, bio-based materials, and recycled materials are applied in the construction of buildings Analyzes the lifecycle of materials, buildings and design and construction operations Covers new methodologies and construction processes Provides case studies on cutting-edge digital technology such as AI and machine learning Examines all aspects of sustainability, including end-of-life of buildings

Building information modelling (BIM) is a set of interacting policies, processes and technologies that generates a methodology to manage the essential building design and project data in digital format throughout the building's life cycle. BIM, makes explicit, the interdependency that exists between structure, architectural layout and mechanical, electrical and hydraulic services by technologically coupling project organizations together. Integrated Building Information Modelling is a handbook on BIM courses, standards and methods used in different regions (Including UK, Africa and Australia). 13 chapters outline essential information about integrated BIM practices such as the BIM in site layout plan, BIM in construction product management, building life cycle assessment, quantity surveying and BIM in hazardous gas monitoring projects while also presenting information about useful BIM tool and case studies. The book is a useful handbook for engineering management professionals and trainees involved in BIM practice.

Due to the complexity, and heterogeneity of the smart grid and the high volume of information to be processed, artificial intelligence techniques and computational intelligence appear to be some of the enabling technologies for its future development and success. The theme of the book is "Making pathway for the grid of future" with the emphasis on trends in Smart Grid, renewable interconnection issues, planning-operation-control and reliability of grid, real time monitoring and protection, market, distributed generation and power distribution issues, power electronics applications, computer-IT and signal processing applications, power apparatus, power engineering education and industry-institute collaboration. The primary objective of the book is to review the current state of the art of the most relevant artificial intelligence techniques applied to the different issues that arise in the smart grid development.

Design and Construction of Smart Cities Toward Sustainable Community Springer Nature

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Recent major earthquakes, tsunamis, hurricanes, floods and other natural phenomena have resulted in huge losses in terms of human life and property destruction. A new range of human-made disasters have afflicted humanity in modern times; terrorist activities have been added to more classical disasters such as those due to the failure of industrial installations. It is important to understand the nature of these global risks to be able to develop strategies to prepare for these events and plan effective responses in terms of disaster management and the associated human health impacts. The selected papers contained in this book have been written by academics and professionals and represent some of the latest developments in the field.

International Academic Conference in Prague 2017

This book addresses key issues across the field of sustainable urban planning, and provides a unique reference tool for planners, engineers, architects, public administrators, and other experts. The evolution of cities and communities is giving rise to pressing energy and environmental problems that demand concrete solutions. In this context, urban planning is inevitably a complex activity that requires a sound analytical interpretation of ongoing developments, multidisciplinary analysis of the available tools and technologies, appropriate political management, and the ability to monitor progress objectively in order to verify the effectiveness of the policies implemented. This book is exceptional in both the breadth of its coverage and its focus on the interactions between different elements. Individual sections focus on strategies and tools for green planning, energy efficiency and sustainability in city planning, sustainable mobility, rating systems, and the smart city approach to improving urban-scale sustainability. The authors draw on their extensive practical experience to provide operational content supplementing the theoretical and methodological elements covered in the text, and each section features informative case studies.

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