

Building Services Engineering Lecture Notes

This book describes the latest advances, innovations, and applications in the field of building design, environmental engineering and sustainability as presented by leading international researchers, engineers, architects and urban planners at the 3rd International Sustainable Buildings Symposium (ISBS), held in Dubai, UAE from 15 to 17 March 2017. It covers highly diverse topics, including smart cities, sustainable building and construction design, sustainable urban planning, infrastructure development, structural resilience under natural hazards, water and waste management, energy efficiency, climate change impacts, life cycle assessment, environmental policies, and strengthening and rehabilitation of structures. The contributions amply demonstrate that sustainable building design is key to protecting and preserving natural resources, economic growth, cultural heritage and public health. The contributions were selected by means of a rigorous peer-review process and highlight many exciting ideas that will spur novel research directions and foster multidisciplinary collaboration among different specialists.

The Cloud Computing and Services Science book comprises a collection of the best papers presented at the International Conference on Cloud Computing and Services Science (CLOSER), which was held in The Netherlands in May 2011. In netting papers from the conference researchers and experts from all over the world explore a wide-ranging variety of the emerging Cloud Computing platforms, models, applications and enabling technologies. Further, in several papers the authors exemplify essential links to Services Science as service development abstraction, service innovation, and service engineering, acknowledging the service-orientation in most current IT-driven structures in the Cloud. The Cloud Computing and Services Science book is organized around important dimensions of technology trends in the domain of cloud computing in relation to a broad scientific understanding of modern services emerging from services science. The papers of this book are inspired by scholarly and practical work on the latest advances related to cloud infrastructure, operations, security, services, and management through the global network. This book includes several features that will be helpful, interesting, and inspirational to students, researchers as well as practitioners. Professionals and decision makers working in this field will also benefit from this book

The Industrial Ventilation Design Guidebook addresses the design of air technology systems for the control of contaminants in industrial workplaces such as factories and manufacturing plants. It covers the basic theories and science behind the technical solutions for industrial air technology and includes publication of new fundamental research and design equations contributed by more than 40 engineers and scientists from over 18 countries. Readers are presented with scientific research and data for improving the indoor air quality in the workplace and reducing emissions to the outside environment. The

Guidebook represents, for the first time, a single source of all current scientific information available on the subject of industrial ventilation and the more general area of industrial air technology. New Russian data is included that fills several gaps in the scientific literature. * Presents technology for energy optimization and environmental benefits * A collaborated effort from more than 60 ventilation experts throughout 18 countries * Based on more than 50 million dollars of research and development focused on industrial ventilation * Includes significant scientific contributions from leading ventilation experts in Russia * Presents new innovations including a rigorous design methodology and target levels * Contains extensive sections on design with modeling techniques * Content is well organized and easily adaptable to computer applications

This volume explores how context has been and can be used in computing to model human behaviors, actions and communications as well as to manage data and knowledge. It addresses context management and exploitation of context for sharing experience across domains. The book serves as a user-centric guide for readers wishing to develop context-based applications, as well as an intellectual reference on the concept of context. It provides a broad yet deep treatment of context in computing and related areas that depend heavily on computing. The coverage is broad because of its cross-disciplinary nature but treats topics at a sufficient depth to permit a reader to implement context in his/her computational endeavors. The volume addresses how context can be integrated in software and systems and how it can be used in a computing environment. Furthermore, the use of context to represent the human dimension, individually as well as collectively is explained. Contributions also include descriptions of how context has been represented in formal as well as non-formal, structured approaches. The last section describes several human behavior representation paradigms based on the concept of context as its central representational element. The depth and breadth of this content is certain to provide useful as well as intellectually enriching information to readers of diverse backgrounds who have an interest in or are intrigued by using context to assist in their representation of the real world.

These proceedings gather selected peer-reviewed papers from the 11th World Congress on Engineering Asset Management (WCEAM), which was held in Jiuzhaigou, China, on 25–28 July, 2016. These proceedings cover a wide range of topics in engineering asset management, including: · strategic asset management; · condition monitoring and diagnostics; · integrated intelligent maintenance; · sensors and devices; · information quality and management; · sustainability in asset management; · asset performance and knowledge management; · data mining and AI techniques in asset management; · engineering standards; and · education in engineering asset management. The breadth and depth of these state-of-the-art, comprehensive proceedings make them an excellent resource for asset management practitioners, researchers and academics, as well as undergraduate and postgraduate students.

This book provides a comprehensive, systematic overview of original theoretical, experimental, and numerical studies in the building services engineering domain. It brings together different strands of the topic, guided by the two key features of energy savings and reduction of the pollutant emissions. Technical, economic, and energy efficiency aspects related to the design, modelling, optimisation, and operation of diverse building services systems are explored. This book includes various theoretical studies, numerical and optimisation models, experiments, and applications in this field, giving an emphasis to: indoor environment quality assurance; energy analysis, modelling, and optimisation of heating systems; improving the energy performance of refrigeration and air-conditioning systems; valorising the solar and geothermal energies; analysis of thermal energy storage technologies; hydraulic simulation and optimisation of water distribution systems; and improving the energy efficiency of water pumping. With 11 pedagogically structured chapters, containing numerous illustrations, tables, and examples, this book provides researchers, lecturers, engineers, and graduate students with a thorough guide to building service engineering.

Edited by Jussi Kantola, the founding faculty member of the world's first university Knowledge Service Engineering Department at Korea Advanced Institute of Science and Technology, and Waldemar Karwowski from the Department of Industrial Engineering and Management Systems at UCF, Knowledge Service Engineering Handbook defines what knowledge services engineering means and how it is different from service engineering and service production. This groundbreaking handbook explores recent advances in knowledge service engineering from the accomplished researchers and practitioners in this field from around the world and provides engineering, systemic, industry, and consumer use viewpoints to knowledge service systems and engineering paradigms. The handbook outlines how to acquire and utilize knowledge in the 21st century presenting multiple cultural aspects including US, European, and Asian perspectives. Organized into four parts, it begins with an introduction to the main concepts of knowledge services. It then explores data, information and knowledge based engineering methods and applications that can be used to develop knowledge services, followed by discussions of the importance of human networks in knowledge services. The handbook concludes with descriptions of high-performance knowledge service systems. This structure allows different uses: the information can be looked up as needed or read in the order presented. As with any new field, the excitement lies in seeing how to combine these advances in data, information, and human parts of knowledge services in the future. While most books on this subject concentrate on data, information, or knowledge, this handbook integrates coverage of all three, thus providing a complete examination of sustainable knowledge services. The handbook has been carefully designed to be of use to professionals who develop new knowledge services and related businesses, for academic researchers and lecturers to start new research projects, and for students studying knowledge

services, knowledge service production, and knowledge service business. This book gathers selected high-impact articles from the 1st International Conference on Data Science, Machine Learning & Applications 2019. It highlights the latest developments in the areas of Artificial Intelligence, Machine Learning, Soft Computing, Human–Computer Interaction and various data science & machine learning applications. It brings together scientists and researchers from different universities and industries around the world to showcase a broad range of perspectives, practices and technical expertise.

This book deals with the energy footprints of biorefineries and the hotel and buildings sector. It presents footprint case studies, which include background information, methodological frameworks, assessment checklists, calculation tools and techniques, applications, challenges and limitations. It also discusses the application of each indicator/framework in various industrial sectors and the associated challenges, along with outlooks for the future. Consumption and conservation of energy are key elements in any industry's sustainability strategy. ?

Services and service oriented computing have emerged and matured over the last decade, bringing with them a number of available services that are selected by users and developers and composed into larger applications. The Handbook of Research on Non-Functional Properties for Service-Oriented Systems: Future Directions unites different approaches and methods used to describe, map, and use non-functional properties and service level agreements. This handbook, which will be useful for both industry and academia, provides an overview of existing research and also sets clear directions for future work.

This book constitutes the refereed proceedings of the First International Conference on Service-Oriented Computing, ICSOC 2003, held in Trento, Italy in December 2003. The 38 revised full papers presented were carefully reviewed and selected from 181 submissions. The papers are organized in topical sections on service description, service composition, quality of service models, service personalization, service semantics, business processes and transactions, business collaborations, service request and coordination, service security and reliability, infrastructure for service delivery, service P2P and grid computing, service and mobile computing, and service computing and applications.

This book shines a spotlight on software-centric networks and their emerging service environments. The authors examine the road ahead for connectivity, for both humans and 'things', considering the rapid changes that have shaken the industry. The book analyses major catalytic shifts that are shaping the communications world: softwarization, virtualization, and cloud computing. It guides the reader through a maze of possible architectural choices, driven by discriminating and sometimes conflicting business considerations. The new ICT capabilities lead us toward smarter environments and to an ecosystem where applications are backed up by shared networking facilities, instead of networks that support their own applications. Growing user awareness is a key driver towards the softwarization process. Softwarization disrupts the current status quo for equipment, development, networks, operations and business. It changes radically the value chain and the involved stakeholders. The dilemma is between a 'slow burn' traditional step-by-step approach and a bold transformation of the whole infrastructure and business models. This book is essential

reading for those seeking to build user-centric communication networks that support independent agile and smart applications. "The book gives an insightful account of modern telecom networks, pinpointing the radical transformations of the last 20 years. This is the perfect read for those who are interested in the grand challenges of networks and in the socio-economic reasons why the telecom industry to embrace the Internet of Things and cyber-physical systems." Prof. Antonio Liotta, Eindhoven University of Technology "This book fulfills an urgent need to thoroughly analyze the entanglement of network and software architectures by taking into account the increasing softwarization. It highlights important issues behind today's business models and opens the road for sustainable future approaches to provide user appreciated valuable services." Dr. Eng. Hendrik Berndt, former CTO of NTT DOCOMO Communications Laboratories Europe

This 6th edition includes numerous revisions, amendments and additions in line with ongoing practice and legislative changes in building construction. Included are features of construction that are designed to economise and manage the use of fuel energy in buildings and limit the effect on atmospheric pollution.

Presenting an analysis of different approaches for predicting the service life of buildings, this monograph discusses various statistical tools and mathematical models, some of which have rarely been applied to the field. It explores methods including deterministic, factorial, stochastic and computational models and applies these to façade claddings. The models allow (i) identification of patterns of degradation, (ii) estimation of service life, (iii) analysis of loss of performance using probability functions, and (iv) estimation of service life using a probability distribution. The final chapter discusses the differences between the different methodologies and their advantages and limitations. The authors also argue that a better understanding of the service life of buildings results in more efficient building maintenance and reduced environmental costs. It not only provides an invaluable resource to students, researchers and industry professionals interested in service life prediction and sustainable construction, but is also of interest to environmental and materials scientists.

This volume is the published Proceedings of selected papers from the IFAC Symposium, Swansea, 11-13 July 1988, where a forum was provided for discussion of the latest advances and techniques in the education of control and instrument engineers. Seven major topics were covered to aid lecturers in understanding, developing and presenting systems engineering - control and measurement - as a subject to undergraduate and postgraduate students. The teaching of real-time computer control as a topic and laboratory experiments for both continuous and discrete systems were discussed, as was process control, with the emphasis on providing the student with engineering experience by using scaled-down equipment which would teach practical skills. Included in the Proceedings are papers on measurement and instrumentation, an area felt to be neglected within academic instruction. The development of software tools for systems design within systems engineering was included, as was the exchange of teaching packages and methods between academics, and the education curriculum of systems engineering within developing countries. These Proceedings will prove to be a useful up-to-date guide and reference source for all lecturers and professors involved in curriculum development and the teaching of control and measurement in systems engineering. This handbook contains information and practical guidance on the environmental issues likely to be encountered at each stage in the tendering and construction phases of a building or civil engineering project. It is aimed at informing construction managers, clients, designers and other consultants, engineers and scientists on their obligations and the opportunities open to

them to improve the industry's environmental performance.

Concerns surrounding environmental sustainability have led to an increase of interest in environmentally-friendly systems. In the ICT realm, attention has been largely paid to green aspects of hardware; however, it is equally necessary to address this issue from the software perspective. *Green Services Engineering, Optimization, and Modeling in the Technological Age* is a valuable reference source of the latest scholarly research on the implementation of green processes into software systems, contributing novel principles, methodologies, and tools to improve software development. Featuring comprehensive and timely coverage on various areas in service strategy and modeling, engineering, and sustainability, this publication is a pivotal reference source for researchers, practitioners, advanced-level students, and end users in the software development realm.

This book presents the combined proceedings of the 12th KIPS International Conference on Ubiquitous Information Technologies and Applications (CUTE 2017) and the 9th International Conference on Computer Science and its Applications (CSA2017), both held in Taichung, Taiwan, December 18 - 20, 2017. The aim of these two meetings was to promote discussion and interaction among academics, researchers and professionals in the field of ubiquitous computing technologies. These proceedings reflect the state of the art in the development of computational methods, involving theory, algorithms, numerical simulation, error and uncertainty analysis and novel applications of new processing techniques in engineering, science, and other disciplines related to ubiquitous computing. James J. (Jong Hyuk) Park received Ph.D. degrees in Graduate School of Information Security from Korea University, Korea and Graduate School of Human Sciences from Waseda University, Japan. From December, 2002 to July, 2007, Dr. Park had been a research scientist of R&D Institute, Hanwha S&C Co., Ltd., Korea. From September, 2007 to August, 2009, He had been a professor at the Department of Computer Science and Engineering, Kyungnam University, Korea. He is now a professor at the Department of Computer Science and Engineering and Department of Interdisciplinary Bio IT Materials, Seoul National University of Science and Technology (SeoulTech), Korea. Dr. Park has published about 200 research papers in international journals and conferences. He has been serving as chair, program committee, or organizing committee chair for many international conferences and workshops. He is a steering chair of international conferences – MUE, FutureTech, CSA, CUTE, UCAWSN, World IT Congress-Jeju. He is editor-in-chief of *Human-centric Computing and Information Sciences (HCIS)* by Springer, *The Journal of Information Processing Systems (JIPS)* by KIPS, and *Journal of Convergence (JoC)* by KIPS CSWRG. He is Associate Editor / Editor of 14 international journals including *JoS*, *JNCA*, *SCN*, *CJ*, and so on. In addition, he has been serving as a Guest Editor for international journals by some publishers: Springer, Elsevier, John Wiley, Oxford Univ. press, Emerald, Inderscience, MDPI. He got the best paper awards from ISA-08 and ITCS-11 conferences and the outstanding leadership awards from IEEE HPCC-09, ICA3PP-10, IEE ISPA-11, PDCAT-11, IEEE AINA-15. Furthermore, he got the outstanding research awards from the SeoulTech, 2014. His research interests include IoT, Human-centric Ubiquitous Computing, Information Security, Digital Forensics, Vehicular Cloud Computing, Multimedia Computing, etc. He is a member of the IEEE, IEEE Computer Society, KIPS, and KMMS. Vincenzo Loia (BS '85, MS '87, PhD '89) is Full Professor of Computer Science. His research interests include Intelligent Agents, Ambient intelligence, Computational Intelligence. Currently he is Founder & Editor-in-chief of "Ambient Intelligence and Humanized Computing", and Co-Editor-in-Chief of "Softcomputing", Springer-Verlag. He is Chair of the Task Forces "Intelligent Agents" and "Ambient Intelligence" IEEE CIS ETTC. He has been Chair the Emergent Technical Committee "Emergent Technology", IEEE CIS Society and Vice-Chair of Intelligent Systems Applications Technical Committee. He has been author of more than 200 scientific works, Editor/co-editor of 4 Books, 64 journal papers, 25 book chapters, and

100 conference papers. He is Senior member of the IEEE, Associate Editor of IEEE Transactions on Industrial Informatics, and Associate Editor of IEEE Transactions on Systems, Man, and Cybernetics: Systems. Many times reviewers for national and international projects, Dr. Loia is active in the research domain of agents, ambient intelligence, computational intelligence, smartgrids, distributed platform for enrich added value. Gangman Yi in Computer Sciences at Texas A&M University, USA in 2007, and doctorate in Computer Sciences at Texas A&M University, USA in 2011. In May 2011, he joined System S/W group in Samsung Electronics, Suwon, Korea. He joined the Department of Computer Science & Engineering, Gangneung-Wonju National University, Korea, since March 2012. Dr. Yi has been researched in an interdisciplinary field of researches. His research focuses especially on the development of computational methods to improve understanding of biological systems and its big data. Dr. Yi actively serves as a managing editor and reviewer for international journals, and chair of international conferences and workshops. Yunsick Sung received his B.S. degree in division of electrical and computer engineering from Pusan National University, Busan, Korea, in 2004, his M.S. degree in computer engineering from Dongguk University, Seoul, Korea, in 2006, and his Ph.D. degree in game engineering from Dongguk University, Seoul, Korea, in 2012. He was employed as a member of the researcher at Samsung Electronics between 2006 and 2009. He was the plural professor at Shinheung College in 2009 and at Dongguk University in 2010. His main research interests are many topics in brain-computer Interface, programming by demonstration, ubiquitous computing and reinforcement learning. His Journal Service Experiences is Associate Editor at Human-centric Computing and Information Sciences, Springer (2015- Current).

This proceeding represents state-of-the-art trends and developments in the emerging field of engineering asset management as presented at the Eight World Congress on Engineering Asset Management (WCEAM). The Proceedings of the WCEAM 2013 is an excellent reference for practitioners, researchers and students in the multidisciplinary field of asset management, covering topics such as: 1. Asset condition monitoring and intelligent maintenance, 2. Asset data warehousing, data mining and fusion, 3. Asset performance and level-of-service models, 4. Design and life-cycle integrity of physical assets, 5. Deterioration and preservation models for assets, 6. Education and training in asset management, 7. Engineering standards in asset management, 8. Fault diagnosis and prognostics, 9. Financial analysis methods for physical assets, 10. Human dimensions in integrated asset management, 11. Information quality management, 12. Information systems and knowledge management, 13. Intelligent sensors and devices, 14. Maintenance strategies in asset management, 15. Optimisation decisions in asset management, 16. Risk management in asset management, 17. Strategic asset management, 18. Sustainability in asset management. King WONG served as Congress Chair for WCEAM 2013 and ICUMAS 2013 is the President of the Hong Kong Institute of Utility Specialists (HKIUS) and Convener of International Institute of Utility Specialists (IIUS). Peter TSE is the Director of the Smart Engineering Asset Management laboratory (SEAM) at the City University of Hong Kong and served as the Chair of WCEAM 2013 Organising Committee. Joseph MATHEW served as the Co-Chair of WCEAM 2013 is also WCEAM's General Chair. He is the Chief Executive Officer of Asset Institute, Australia.

The book consists of original research papers in the field of Technological Advancements in Construction. It covers such topics as non-destructive testing, structural health monitoring, innovative composite materials, strengthening and rehabilitation of buildings and structures, seismic resilience of structures, thermal protection of buildings, construction and operation of buildings and structures in extreme climatic conditions, structural dynamics and vibration control, and green construction. The book contains latest information on structural mechanics of composite materials and structures, theoretical and computational modeling of new materials and structures, experimental and numerical analysis in building rehabilitation and

strengthening, analytical, numerical and experimental methodologies for the analysis of multilayered structures, and advanced methods for seismic performance evaluation of building structures. The book includes original research and application papers of high academic level, where significant scientific novelty is clearly demonstrated. The book presents a valuable tool for researchers and construction professionals.

With rapid economic and industrial development in China, India and elsewhere, fluid-related structural vibration and noise problems are widely encountered in many fields, just as they are in the more developed parts of the world, causing increasingly grievous concerns. Turbulence clearly has a significant impact on many such problems. On the other hand, new opportunities are emerging with the advent of various new technologies, such as signal processing, flow visualization and diagnostics, new functional materials, sensors and actuators, etc. These have revitalized interdisciplinary research activities, and it is in this context that the 2nd symposium on fluid-structure-sound interactions and control (FSSIC) was organized. Held in Hong Kong (May 20-21, 2013) and Macau (May 22-23, 2013), the meeting brought together scientists and engineers working in all related branches from both East and West and provided them with a forum to exchange and share the latest progress, ideas and advances and to chart the frontiers of FSSIC. The Proceedings of the 2nd Symposium on Fluid-Structure-Sound Interactions and Control largely focuses on advances in the theory, experimental research and numerical simulations of turbulence in the contexts of flow-induced vibration, noise and their control. This includes several practical areas for interaction, such as the aerodynamics of road and space vehicles, marine and civil engineering, nuclear reactors and biomedical science etc. One of the particular features of these proceedings is that it integrates acoustics with the study of flow-induced vibration, which is not a common practice but is scientifically very helpful in understanding, simulating and controlling vibration. This offers a broader view of the discipline from which readers will benefit greatly. These proceedings are intended for academics, research scientists, design engineers and graduate students in engineering fluid dynamics, acoustics, fluid and aerodynamics, vibration, dynamical systems and control etc. Yu Zhou is a professor in Institute for Turbulence-Noise-Vibration Interaction and Control at Harbin Institute of Technology. Yang Liu is an associate professor at The Hong Kong Polytechnic University. Lixi Huang, associate professor, works at the University of Hong Kong. Professor Dewey H. Hodges works at the School of Aerospace Engineering, Georgia Institute of Technology. The nation's physical infrastructure facilitates movement of people and goods; provides safe water; provides energy when and where needed; removes wastes; enables rapid communications; and generally supports our economy and quality of life. Developing a framework for guiding attempts at measuring the performance of infrastructure systems and grappling with the concept of defining good performance are the major themes of this book. Focusing on urban regions, within a context of national policy, the volume provides the basis for further in-depth analysis and application at the local, regional, state, and national levels.

Proceedings of the 8th International Symposium on Heating, Ventilation and Air Conditioning is based on the 8th International Symposium of the same name (ISHVAC2013), which took place in Xi'an on October 19-21, 2013. The conference series was initiated at Tsinghua University in 1991 and has since become the premier international HVAC conference initiated in China, playing a significant part in the development of HVAC and indoor environmental research and industry around the world. This international conference provided an exclusive opportunity for policy-makers, designers, researchers, engineers and managers to share their experience. Considering the recent attention on building energy consumption and indoor

environments, ISHVAC2013 provided a global platform for discussing recent research on and developments in different aspects of HVAC systems and components, with a focus on building energy consumption, energy efficiency and indoor environments. These categories span a broad range of topics, and the proceedings provide readers with a good general overview of recent advances in different aspects of HVAC systems and related research. As such, they offer a unique resource for further research and a valuable source of information for those interested in the subject. The proceedings are intended for researchers, engineers and graduate students in the fields of Heating, Ventilation and Air Conditioning (HVAC), indoor environments, energy systems, and building information and management. Angui Li works at Xi'an University of Architecture and Technology, Yingxin Zhu works at Tsinghua University and Yuguo Li works at The University of Hong Kong.

This book includes a selection of reviewed papers presented at the 2016 China Academic Conference on Printing, Packaging Engineering & Media Technology, held on November 25-27, 2016 in Xi'an, China. The conference was jointly organized by China Academy of Printing Technology, Xi'an University of Technology and Stuttgart Media University of Germany. The proceedings cover the recent outcomes on color science and technology, image processing technology, digital media technology, digital process management technology in packaging and packaging etc. They will be of interest to university researchers, R&D engineers and graduate students in graphic communications, packaging, color science, image science, material science, computer science, digital media and network technology fields.

This volume contains revised and extended research articles written by prominent researchers participating in the international conference on Advances in Engineering Technologies and Physical Science was held in Hong Kong, 13-15 March, 2013. Topics covered include engineering physics, engineering mathematics, scientific computing, control theory, automation, artificial intelligence, electrical engineering, and industrial applications. The book offers the state of art of tremendous advances in engineering technologies and physical science and applications, and also serves as an excellent reference work for researchers and graduate students working with/on engineering technologies and physical science and applications.

This book presents the selected peer-reviewed proceedings of the International Conference on Recent Trends and Innovations in Civil Engineering (ICRTICE 2019). The volume focuses on latest research and advances in the field of civil engineering and materials science such as design and development of new environmental materials, performance testing and verification of smart materials, performance analysis and simulation of steel structures, design and performance optimization of concrete structures, and building materials analysis. The book also covers studies in geotechnical engineering, hydraulic engineering, road and bridge engineering, building services design, engineering management, water resource engineering and renewable energy. The contents of this book will be useful for students, researchers and professionals working in civil engineering.

This is a comprehensive review of research related to construction informatics, with a particular focus on the related 5th framework EU projects on product and process technology and the implementation of the new economy technologies and business models in the construction industry.

The idea about this book has evolved during the process of its preparation as some of the results have been achieved in parallel with its writing. One reason for this is that in this area of research results are very quickly updated. Another is, possibly, that a strong, unchallenged theoretical basis in this field still does not fully exist. From other hand, the rate of innovation, competition and demand from different branches of industry (from biotech industry to civil and building engineering, from market forecasting to civil aviation, from robotics to emerging e-commerce) is increasingly pressing for more customised solutions based on learning consumers behaviour. A highly interdisciplinary and rapidly innovating field is forming which focus is the design of intelligent, self-adapting systems and machines. It is on the crossroads of control theory, artificial and computational intelligence, different engineering disciplines borrowing heavily from the biology and life sciences. It is often called intelligent control, soft computing or intelligent technology. Some other branches have appeared recently like intelligent agents (which migrated from robotics to different engineering fields), data fusion, knowledge extraction etc., which are inherently related to this field. The core is the attempts to enhance the abilities of the classical control theory in order to have more adequate, flexible, and adaptive models and control algorithms.

Course on Engineering of Building Services Lecture Notes
Recent Trends in Civil Engineering
Select Proceedings of ICRTICE 2019
Springer Nature
Biografie van de Deense ingenieur (1895-1988).

Do Smart Adaptive Systems Exist? is intended as a reference and a guide summarising and focusing on best practices when using intelligent techniques and building systems requiring a degree of adaptation and intelligence. It is therefore not intended as a collection of the most recent research results, but as a practical guide for experts from other areas and industrial users interested in building solutions to their problems using intelligent techniques. One of the main issues covered is an attempt to answer the question of how to select and/or combine suitable intelligent techniques from a large pool of potential solutions. Another attractive feature of the book is that it brings together experts from neural network, fuzzy, machine learning, evolutionary and hybrid systems communities who will provide their views on how these different intelligent technologies have contributed and will contribute to creation of smart adaptive systems of the future.

This book presents selected articles from the 5th International Conference on Geotechnics, Civil Engineering Works and Structures, held in Ha Noi, focusing on the theme "Innovation for Sustainable Infrastructure", aiming to not only raise awareness of the vital importance of sustainability in infrastructure development but to also highlight the essential roles of innovation and technology in planning and building sustainable infrastructure. It provides an international platform for researchers, practitioners, policymakers and entrepreneurs to present their recent advances and to exchange knowledge and experience on various topics related to the theme of "Innovation for Sustainable Infrastructure".

'Several high quality scientific journals are published in the area of building energy and indoor/outdoor environment; however, one has been missing. Advances in Building Energy Research fills the gap. I recommend ABER to all technical libraries, research institutes and universities. It should also be used by construction companies and those manufacturing building materials and building products.' Professor Olli Seppnen,

President of REHVA (Federation of Heating and Air-conditioning Associations)
'Advances in Building Energy Research is a unique index. It will be an inexhaustible resource for energy related sciences and a continuous inspiration for architects around the world.' N. Fintikakis, Architect and Director of UIA-ARES WP (Architecture and Renewable Energy Sources) Advances in Building Energy Research (ABER) offers state-of-the-art information on the environmental science and performance of buildings, linking new technologies and methodologies with the latest research on systems, simulations and standards. As stringently reviewed as a journal but with the breadth of a book, this annual volume brings together invited contributions from the foremost international experts on energy efficiency and environmental quality of buildings. Spanning a broad range of technical subjects, this is a 'must have' reference on global developments in the field, suitable for architects and building engineers, environmental engineers, industry professionals, students, teachers and researchers in building science, technical libraries and laboratories.

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