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Optimum Signal Processing - Sophocles J. Orfanidis 2007

Smart Antennas - Thomas Kaiser 2005
Smart Antennas—State of the Art brings together the broad expertise of 41 European experts in smart antennas. They provide a comprehensive review and an extensive analysis of the recent progress and new results generated during the last years in almost all fields of smart antennas and MIMO (multiple-input multiple-output) transmission. The following represents a summarized table of content.
Receiver: space-time processing, antenna combining, reduced rank processing, robust beamforming, subspace methods, synchronization, equalization, multiuser detection, iterative methods
Channel: propagation, measurements and sounding, modelling, channel estimation, direction-of-arrival estimation, subscriber location estimation
Transmitter: space-time block coding, channel side information, unified design of linear transceivers, ill-conditioned channels, MIMO-MAC strategies
Network Theory: channel capacity, network capacity, multihop networks
Technology: antenna design, transceivers, demonstrators and testbeds, future air interfaces
Applications and Systems: 3G system and link level aspects, MIMO HSDPA, MIMO-WLAN/UMTS implementation issues
This book serves as a reference for scientists and engineers who need to be aware of the leading edge research in multiple-antenna communications, an essential technology for emerging broadband wireless systems.
Aspects of Modern Radar - Eli Brookner 1988

Digital Signal Processing Using MATLAB - Andr  Quinquis 2010-01-05

This book uses MATLAB as a computing tool to explore traditional DSP topics and solve problems. This greatly expands the range and complexity of problems that students can effectively study in signal processing courses. A large number of worked examples, computer simulations and applications are provided, along with theoretical aspects that are essential in order to gain a good understanding of the main topics. Practicing engineers may also find it useful as an introductory text on the subject.

Blind Speech Separation - Shoji Makino 2007-09-07

This is the world's first edited book on independent component analysis (ICA)-based blind source separation (BSS) of convolutive mixtures of speech. This book brings together a small number of leading researchers to provide tutorial-like and in-depth treatment on major ICA-based BSS topics, with the objective of becoming the definitive source for current, comprehensive, authoritative, and yet accessible treatment.

Insight Through Computing - Charles F. Van Loan 2010-01-01

An introduction to computer-based problem-solving using the MATLAB® environment for undergraduates.

Coexistence of IMT-Advanced Systems for Spectrum Sharing with FSS Receivers in C-Band and Extended C-Band - Lway Faisal Abdulrazak 2017-12-06

This book provides information regarding spectrum sharing between wireless systems, motivated by emerging new technologies.

Readers will benefit from information about how to conduct research on the interference mitigation between IMT-Advanced and FSS. The author presents a deterministic analysis for interference to noise ratio (I/N), adjacent channel interference ratio (ACIR), field strength, and path loss propagation, in order to determine the separation distances in the co-channel interference (CCI) and adjacent channel Interference (ACI) scenarios. An analytical model is discussed, for the shielding mitigation technique based on the deterministic analysis of the propagation model. The shielding technique has been developed based on test bed measurements for evaluating the attenuation of the proposed materials. MatlabTM and Transfinite Visualyse ProTM have been used as simulation tools for the verification of the obtained results, whereas the IMT-Advanced parameters have been represented by Worldwide Interoperability for Microwave Access (WiMAX) 802.16e.

Computer Aided Systems Theory - EUROCAST 2019 - Roberto Moreno-Díaz 2020-04-15

The two-volume set LNCS 12013 and 12014 constitutes the thoroughly refereed proceedings of the 17th International Conference on Computer Aided Systems Theory, EUROCAST 2019, held in Las Palmas de Gran Canaria, Spain, in February 2019. The 123 full papers presented were carefully reviewed and selected from 172 submissions. The papers are organized in the following topical sections: Part I: systems theory and applications; pioneers and landmarks in the development of information and communication technologies; stochastic models and applications to natural, social and technical systems; theory and applications of metaheuristic algorithms; model-based system design, verification and simulation. Part II: applications of signal processing technology; artificial intelligence and data mining for intelligent transportation systems and smart mobility; computer vision, machine learning for image analysis and applications; computer and systems based methods and electronic technologies in medicine; advances in biomedical signal and image processing; systems concepts and methods in touristic flows; systems in industrial robotics, automation and IoT.

Modal Array Signal Processing: Principles

and Applications of Acoustic Wavefield Decomposition - Heinz Teutsch 2007-01-10

This book deals with the problem of detecting and localizing multiple simultaneously active wideband acoustic sources by applying the notion of wavefield decomposition using circular and spherical microphone arrays. A rigorous derivation of modal array signal processing algorithms for unambiguous source detection and localization, as well as performance evaluations by means of measurements using an actual real-time capable implementation, are discussed.

Fundamentals of Spherical Array Processing - Boaz Rafaely 2019

This book provides a comprehensive introduction to the theory and practice of spherical microphone arrays, and was written for graduate students, researchers and engineers who work with spherical microphone arrays in a wide range of applications. The new edition includes additions and modifications, and references supplementary Matlab code to provide the reader with a straightforward start for own implementations. The book is also accompanied by a Matlab manual, which explains how to implement the examples and simulations presented in the book. The first two chapters provide the reader with the necessary mathematical and physical background, including an introduction to the spherical Fourier transform and the formulation of plane-wave sound fields in the spherical harmonic domain. In turn, the third chapter covers the theory of spatial sampling, employed when selecting the positions of microphones to sample sound pressure functions in space. Subsequent chapters highlight various spherical array configurations, including the popular rigid-sphere-based configuration. Beamforming (spatial filtering) in the spherical harmonics domain, including axis-symmetric beamforming, and the performance measures of directivity index and white noise gain are introduced, and a range of optimal beamformers for spherical arrays, including those that achieve maximum directivity and maximum robustness are developed, along with the Dolph-Chebyshev beamformer. The final chapter discusses more advanced beamformers, such as MVDR (minimum variance distortionless response) and

LCMV (linearly constrained minimum variance) types, which are tailored to the measured sound field.

Mathematical Methods and Algorithms for Signal Processing - Todd K. Moon 2005-02-01

Principles and Applications of RELAX: A Robust and Universal Estimator - Renbiao Wu 2019-03-27

The multiple signal demixing and parameter estimation problems that result from the impacts of background noise and interference are issues that are frequently encountered in the fields of radar, sonar, communications, and navigation. Research in the signal processing and control fields has always focused on improving the estimation performance of parameter estimation methods at low SNR and maintaining the robustness of estimations in the presence of model errors. This book presents a universal and robust relaxation estimation method (RELAX), and introduces its basic principles and applications in the fields of classical line spectrum estimation, time of delay estimation, DOA estimation, and radar target imaging. This information is explained comprehensively and in great detail, and uses metaphors pertaining to romantic relationships to visualize the basic problems of parameter estimation, the basic principles of the five types of classical parameter estimation methods, and the relationships between these principles. The book serves as a reference for scientists and technologists in the fields of signal processing and control, while also providing relevant information for graduate students in the related fields.

Handbook of Antennas in Wireless Communications - Lal Chand Godara 2018-10-03

The move toward worldwide wireless communications continues at a remarkable pace, and the antenna element of the technology is crucial to its success. With contributions from more than 30 international experts, the Handbook of Antennas in Wireless Communications brings together all of the latest research and results to provide engineering professionals and students with a one-stop reference on the theory, technologies, and applications for indoor, hand-held, mobile, and satellite systems. Beginning with an introduction

to wireless communications systems, it offers an in-depth treatment of propagation prediction and fading channels. It then explores antenna technology with discussion of antenna design methods and the various antennas in current use or development for base stations, hand held devices, satellite communications, and shaping beams. The discussions then move to smart antennas and phased array technology, including details on array theory and beamforming techniques. Space diversity, direction-of-arrival estimation, source tracking, and blind source separation methods are addressed, as are the implementation of smart antennas and the results of field trials of systems using smart antennas implemented. Finally, the hot media topic of the safety of mobile phones receives due attention, including details of how the human body interacts with the electromagnetic fields of these devices. Its logical development and extensive range of diagrams, figures, and photographs make this handbook easy to follow and provide a clear understanding of design techniques and the performance of finished products. Its unique, comprehensive coverage written by top experts in their fields promises to make the Handbook of Antennas in Wireless Communications the standard reference for the field.

Wireless Communications - Andreas F. Molisch 2012-02-06

"Professor Andreas F. Molisch, renowned researcher and educator, has put together the comprehensive book, Wireless Communications. The second edition, which includes a wealth of new material on important topics, ensures the role of the text as the key resource for every student, researcher, and practitioner in the field." —Professor Moe Win, MIT, USA Wireless communications has grown rapidly over the past decade from a niche market into one of the most important, fast moving industries. Fully updated to incorporate the latest research and developments, Wireless Communications, Second Edition provides an authoritative overview of the principles and applications of mobile communication technology. The author provides an in-depth analysis of current treatment of the area, addressing both the traditional elements, such as Rayleigh fading, BER in flat fading channels, and equalisation,

and more recently emerging topics such as multi-user detection in CDMA systems, MIMO systems, and cognitive radio. The dominant wireless standards; including cellular, cordless and wireless LANs; are discussed. Topics featured include: wireless propagation channels, transceivers and signal processing, multiple access and advanced transceiver schemes, and standardised wireless systems. Combines mathematical descriptions with intuitive explanations of the physical facts, enabling readers to acquire a deep understanding of the subject. Includes new chapters on cognitive radio, cooperative communications and relaying, video coding, 3GPP Long Term Evolution, and WiMax; plus significant new sections on multi-user MIMO, 802.11n, and information theory. Companion website featuring: supplementary material on 'DECT', solutions manual and presentation slides for instructors, appendices, list of abbreviations and other useful resources.

Smart Antennas for Wireless

Communications - Frank Gross 2005-10-05

Smart antennas boost the power of a wireless network, saving energy and money and greatly increasing the range of wireless broadband. Smart Antennas is a rigorous textbook on smart antenna design and deployment.

Introduction to Direction-of-Arrival

Estimation - Zhizhang Chen 2010

Direction-of-Arrival (DOA) estimation concerns the estimation of direction finding signals in the form of electromagnetic or acoustic waves, impinging on a sensor or antenna array. DOA estimation is used for locating and tracking signal sources in both civilian and military applications. This authoritative volume provides an overview and performance analysis of the basic DOA algorithms, including comparisons between the various types. The book offers you a detailed understanding of the arrays pertinent to DOA finding, and presents a detailed illustration of the ESPRIT-based DOA algorithms complete with their performance assessments. From antennas and array receiving systems, to advanced topics on DOA estimation, this book serves as a one-stop resource for professionals and students. Nearly 100 illustrations and more than 281 equations support key topics throughout.

Digital Signal and Image Processing Using

MATLAB - Gerard Blanchet 2006-05-22

This title provides the most important theoretical aspects of Image and Signal Processing (ISP) for both deterministic and random signals. The theory is supported by exercises and computer simulations relating to real applications. More than 200 programs and functions are provided in the MATLAB® language, with useful comments and guidance, to enable numerical experiments to be carried out, thus allowing readers to develop a deeper understanding of both the theoretical and practical aspects of this subject.

Radar Networks - Hai Deng 2020-06-09

Radar networks are increasingly regarded as an efficient approach to enhancing radar capabilities in the face of popular anti-radar techniques and hostile operating environments. Reader-friendly and self-contained, this book provides a comprehensive overview of the latest radar networking technologies. The text addresses basic, relevant aspects of radar signal processing and statistical theories, including both civilian and military radar applications. It also discusses emerging topics that directly relate to networks, such as multiple-input-multiple-output (MIMO) radars, waveform design, and diversity via multiple transmitters. Other topics covered include target recognition and imaging using radar networks. Features Gives a comprehensive view of the latest radar network technologies Covers both civilian and military applications of radar Provides basic statistics and signal processing necessary for understanding radar networks Includes up-to-date information on MIMO radars Presents waveform design and diversity for radar networks with multiple transmitters

Digital Signal Processing Handbook on CD-ROM - VIJAY MADISETTI 1999-02-26

A best-seller in its print version, this comprehensive CD-ROM reference contains unique, fully searchable coverage of all major topics in digital signal processing (DSP), establishing an invaluable, time-saving resource for the engineering community. Its unique and broad scope includes contributions from all DSP specialties, including: telecommunications, computer engineering, acoustics, seismic data analysis, DSP software and hardware, image and video processing, remote sensing, multimedia

applications, medical technology, radar and sonar applications

International Conference on 3G Mobile Communication Technologies - 2000

Antenna Arrays and Beam-formation - Modar Shbat 2017-05-10

Spatial processing and smart antenna beam formation are considered as completely essential approaches to be employed for forthcoming progress in the standards and implementation of the wireless communication systems. The book aims, besides introducing up-to-date contributions that are not readily available in the related literature, to present and demonstrate the recent research ideas in the field of antenna array design and beam-forming algorithms in a synthetic, coherent, and unified manner for the interested researchers. The presented topics range from relatively straightforward mathematical analysis and derivations to simulation and empirical results. The book is designed to serve as an informative reference for the researcher involved in the analysis of the spatial signal processing techniques for smart antenna systems. The book will help the readers, in particular wireless communication researchers, to have wider futuristic and innovative visions for the advances in the field.

Introduction to Scientific Computing - Charles F. Van Loan 2000

Unique in content and approach, this book covers all the topics that are usually covered in an introduction to scientific computing--but folds in graphics and matrix-vector manipulation in a way that gets readers to appreciate the connection between continuous mathematics and computing. MATLAB 5 is used throughout to encourage experimentation, and each chapter focuses on a different important theorem--allowing readers to appreciate the rigorous side of scientific computing. In addition to standard topical coverage, each chapter includes 1) a sketch of a "hard" problem that involves ill-conditioning, high dimension, etc.; 2) at least one theorem with both a rigorous proof and a "proof by MATLAB" experiment to bolster intuition; 3) at least one recursive algorithm; and 4) at least one connection to a real-world application. The book revolves around examples that are packaged in 200+ M-files, which, collectively,

communicate all the key mathematical ideas and an appreciation for the subtleties of numerical computing. Power Tools of the Trade. Polynomial Interpolation. Piecewise Polynomial Interpolation. Numerical Integration. Matrix Computations. Linear Systems. The QR and Cholesky Factorizations. Nonlinear Equations and Optimization. The Initial Value Problem. For engineers and mathematicians.

Digital Signal and Image Processing Using MATLAB - Maurice Charbit 2010-01-05

This title provides the most important theoretical aspects of Image and Signal Processing (ISP) for both deterministic and random signals. The theory is supported by exercises and computer simulations relating to real applications. More than 200 programs and functions are provided in the MATLAB® language, with useful comments and guidance, to enable numerical experiments to be carried out, thus allowing readers to develop a deeper understanding of both the theoretical and practical aspects of this subject.

Advanced Signal Processing and Digital Noise Reduction - Saeed V. Vaseghi 1996-07-25

Noise cancellation is particularly important in the new mobile communications field, with respect to background noise and acoustic interference in moving vehicles. This comprehensive text develops a coherent and structured presentation of a broad range of the theory and application of statistical signal processing, with emphasis on digital noise reduction algorithms. Other applications covered are spectral estimation, channel equalisation, speech coding over noisy channels, speech recognition in adverse environments, active noise control, echo cancellation, restoration of lost filters, and adaptive notch filters.

MATLAB/Simulink for Digital Signal Processing - Won Y. Yang 2015-03-02

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Advances in Condition Monitoring of Machinery in Non-Stationary Operations -

Fakher Chaari 2015-07-16

The book provides readers with a snapshot of recent research and technological trends in the field of condition monitoring of machinery working under a broad range of operating conditions. Each chapter, accepted after a rigorous peer-review process, reports on an original piece of work presented and discussed at the 4th International Conference on Condition Monitoring of Machinery in Non-stationary Operations, CMMNO 2014, held on December 15-16, 2014, in Lyon, France. The contributions have been grouped into three different sections according to the main subfield (signal processing, data mining or condition monitoring techniques) they are related to. The book includes both theoretical developments as well as a number of industrial case studies, in different areas including, but not limited to: noise and vibration; vibro-acoustic diagnosis; signal processing techniques; diagnostic data analysis; instantaneous speed identification; monitoring and diagnostic systems; and dynamic and fault modeling. This book not only provides a valuable resource for both academics and professionals in the field of condition monitoring, it also aims at facilitating communication and collaboration between the two groups.

Communications and Networking - Honghao Gao 2021-02-01

This proceedings constitutes the refereed proceedings of the 15th EAI International Conference on Communications and Networking, ChinaCom 2020, held in November 2020 in Shanghai, China. Due to COVID-19 pandemic the conference was held virtually. The 54 papers presented were carefully selected from 143 submissions. The papers are organized in topical sections on Transmission Optimization in Edge Computing; Performance and Scheduling Optimization in Edge Computing; Mobile Edge Network System; Communication Routing and Control; Transmission and Load Balancing; Edge Computing and Distributed

Machine Learning; Deep Learning.

Handbook of Linear Algebra - Leslie Hogben 2006-11-02

The Handbook of Linear Algebra provides comprehensive coverage of linear algebra concepts, applications, and computational software packages in an easy-to-use handbook format. The esteemed international contributors guide you from the very elementary aspects of the subject to the frontiers of current research. The book features an accessibl

Optimum Array Processing - Harry L. Van Trees 2002-04-04

Well-known authority, Dr. Van Trees updates array signal processing for today's technology. This is the most up-to-date and thorough treatment of the subject available. Written in the same accessible style as Van Tree's earlier classics, this completely new work covers all modern applications of array signal processing, from biomedicine to wireless communications. *Data-Centric Business and Applications* - Dmytro Ageyev 2021-06-04

This book, building on the authors' previous work, presents new communication and networking technologies, challenges and opportunities of information/data processing and transmission. It also discusses the development of more intelligent and efficient communication technologies, which are an essential part of current day-to-day life. Information and Communication Technologies (ICTs) have an enormous impact on businesses and our day-to-day lives over the past three decades and continue to do so. Modern methods of business information processing are opening exciting new opportunities for doing business on the basis of information technologies. The book contains research that spans a wide range of communication and networking technologies, including wireless sensor networks, optical and telecommunication networks, storage area networks, error-free transmission and signal processing.

Communications, Signal Processing, and Systems - Qilian Liang 2019-08-14

This book brings together papers from the 2018 International Conference on Communications, Signal Processing, and Systems, which was held in Dalian, China on July 14-16, 2018. Presenting the latest developments and discussing the

interactions and links between these multidisciplinary fields, the book spans topics ranging from communications, signal processing and systems. It is aimed at undergraduate and graduate electrical engineering, computer science and mathematics students, researchers and engineers from academia and industry as well as government employees.

Index to Theses with Abstracts Accepted for Higher Degrees by the Universities of Great Britain and Ireland and the Council for National Academic Awards - 2004

The 11th IEEE International Symposium on Personal, Indoor and Mobile Radio Communications - 2000

Narrowband Direction of Arrival Estimation for Antenna Arrays - Jeffrey Foutz 2008

This book provides an introduction to narrowband array signal processing, classical and subspace-based direction of arrival (DOA) estimation with an extensive discussion on adaptive direction of arrival algorithms. The book begins with a presentation of the basic theory, equations, and data models of narrowband arrays. It then discusses basic beamforming methods and describes how they relate to DOA estimation. Several of the most common classical and subspace-based direction of arrival methods are discussed. The book concludes with an introduction to subspace tracking and shows how subspace tracking algorithms can be used to form an adaptive DOA estimator. Simulation software and additional bibliography are given at the end of the book.

Journal of VLSI Signal Processing Systems for Signal, Image, and Video Technology - 2007

Communications and Networking - Bo Li
2018-03-19

The two-volume set LNICST 236-237 constitutes the post-conference proceedings of the 12th EAI International Conference on Communications and Networking, ChinaCom 2017, held in Xi'an, China, in September 2017. The total of 112 contributions presented in these volumes are carefully reviewed and selected from 178 submissions. Aside from the technical paper sessions the book is organized in topical sections

on wireless communications and networking, satellite and space communications and networking, big data network track, multimedia communications and smart networking, signal processing and communications, network and information security, advances and trends of V2X networks.

The Theory of Linear Prediction - P. P. Vaidyanathan 2008

Linear prediction theory has had a profound impact in the field of digital signal processing. Although the theory dates back to the early 1940s, its influence can still be seen in applications today. The theory is based on very elegant mathematics and leads to many beautiful insights into statistical signal processing. Although prediction is only a part of the more general topics of linear estimation, filtering, and smoothing, this book focuses on linear prediction. This has enabled detailed discussion of a number of issues that are normally not found in texts. For example, the theory of vector linear prediction is explained in considerable detail and so is the theory of line spectral processes. This focus and its small size make the book different from many excellent texts which cover the topic, including a few that are actually dedicated to linear prediction. There are several examples and computer-based demonstrations of the theory. Applications are mentioned wherever appropriate, but the focus is not on the detailed development of these applications. The writing style is meant to be suitable for self-study as well as for classroom use at the senior and first-year graduate levels. The text is self-contained for readers with introductory exposure to signal processing, random processes, and the theory of matrices, and a historical perspective and detailed outline are given in the first chapter. Table of Contents: Introduction / The Optimal Linear Prediction Problem / Levinson's Recursion / Lattice Structures for Linear Prediction / Autoregressive Modeling / Prediction Error Bound and Spectral Flatness / Line Spectral Processes / Linear Prediction Theory for Vector Processes / Appendix A: Linear Estimation of Random Variables / B: Proof of a Property of Autocorrelations / C: Stability of the Inverse Filter / Recursion Satisfied by AR Autocorrelations

5G Wireless Systems - Yang Yang 2017-09-14

This book focuses on key simulation and evaluation technologies for 5G systems. Based on the most recent research results from academia and industry, it describes the evaluation methodologies in depth for network and physical layer technologies. The evaluation methods are discussed in depth. It also covers the analysis of the 5G candidate technologies and the testing challenges, the evolution of the testing technologies, fading channel measurement and modeling, software simulations, software hardware cosimulation, field testing and other novel evaluation methods. The fifth-generation (5G) mobile communications system targets highly improved network performances in terms of the network capacity and the number of connections. Testing and evaluation technologies is widely recognized and plays important roles in the wireless technology developments, along with the research on basic theory and key technologies. The investigation and developments on the multi-level and comprehensive evaluations for 5G new technologies, provides important performance references for the 5G technology filtering and future standardizations. Students focused on telecommunications, electronic engineering, computer science or other related disciplines will find this book useful as a secondary text. Researchers and professionals working within these related fields will also find this book useful as a reference.

Classical and Modern Direction-of-Arrival

Estimation - T. Engin Tuncer 2009-07-10

Classical and Modern Direction of Arrival

Estimation contains both theory and practice of direction finding by the leading researchers in the field. This unique blend of techniques used in commercial DF systems and state-of-the art super-resolution methods is a valuable source of information for both practicing engineers and researchers. Key topics covered are: Classical methods of direction finding Practical DF methods used in commercial systems Calibration in antenna arrays Array mapping, fast algorithms and wideband processing Spatial time-frequency distributions for DOA estimation DOA estimation in threshold region Higher order statistics for DOA estimation Localization in sensor networks and direct position estimation Brings together in one book classical and

modern DOA techniques, showing the connections between them Contains contributions from the leading people in the field Gives a concise and easy-to-read introduction to the classical techniques Evaluates the strengths and weaknesses of key super-resolution techniques Includes applications to sensor networks

Proceedings of the 2011 International Conference on Informatics, Cybernetics, and Computer Engineering (ICCE2011) November 19-20, 2011, Melbourne, Australia - Liangzhong Jiang 2011-11-24

The volume includes a set of selected papers extended and revised from the International Conference on Informatics, Cybernetics, and Computer Engineering. An information system (IS) - or application landscape - is any combination of information technology and people's activities using that technology to support operations, management. In a very broad sense, the term information system is frequently used to refer to the interaction between people, algorithmic processes, data and technology. In this sense, the term is used to refer not only to the information and communication technology (ICT) an organization uses, but also to the way in which people interact with this technology in support of business processes. Some make a clear distinction between information systems, and computer systems ICT, and business processes. Information systems are distinct from information technology in that an information system is typically seen as having an ICT component. It is mainly concerned with the purposeful utilization of information technology. Information systems are also different from business processes. Information systems help to control the performance of business processes. Computer engineering, also called computer systems engineering, is a discipline that integrates several fields of electrical engineering and computer science required to develop computer systems. Computer engineers usually have training in electronic engineering, software design, and hardware-software integration instead of only software engineering or electronic engineering. Computer engineers are involved in many hardware and software aspects of computing, from the design of individual

microprocessors, personal computers, and supercomputers, to circuit design. This field of engineering not only focuses on how computer systems themselves work, but also how they integrate into the larger picture. ICCE 2011 Volume 2 is to provide a forum for researchers, educators, engineers, and government officials involved in the general areas of Information system and Software Engineering to disseminate their latest research results and exchange views on the future research directions of these fields. 81 high-quality papers are included in the

volume. Each paper has been peer-reviewed by at least 2 program committee members and selected by the volume editor. Special thanks to editors, staff of association and every participants of the conference. It's you make the conference a success. We look forward to meeting you next year. Special thanks to editors, staff of association and every participants of the conference. It's you make the conference a success. We look forward to meeting you next year.