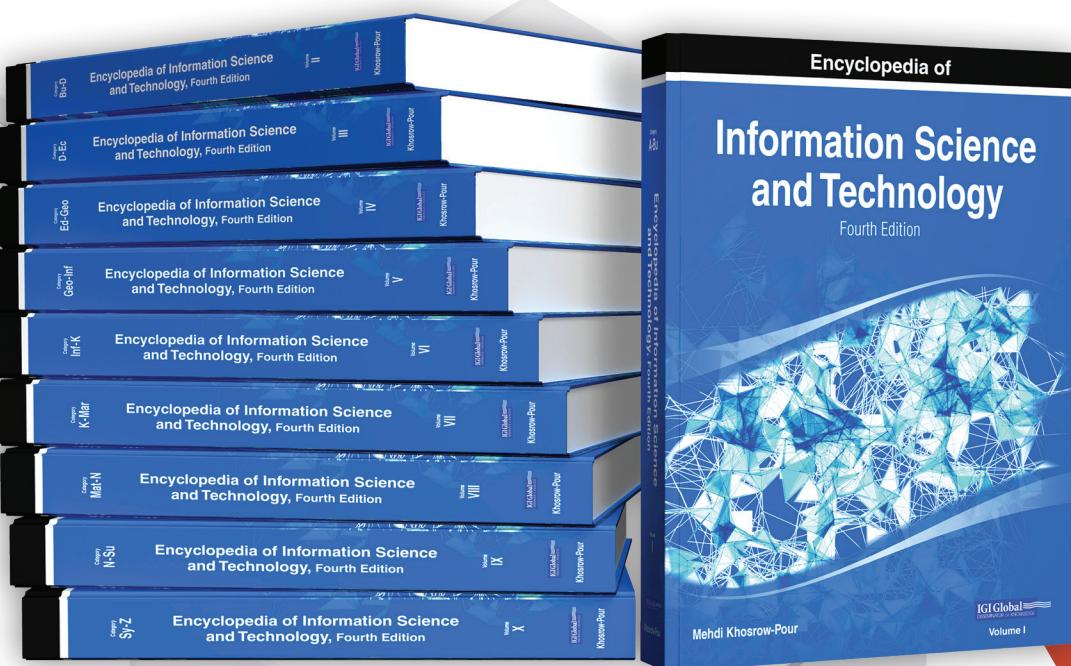


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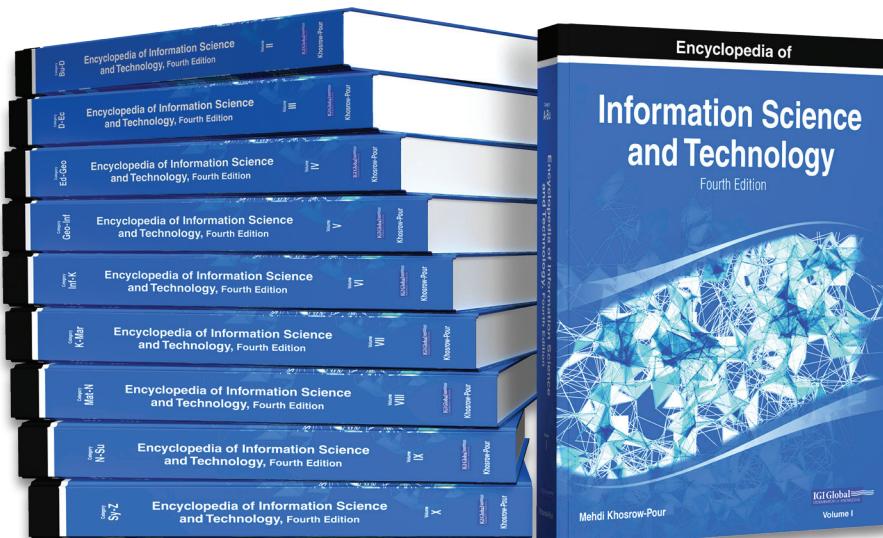
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Table of Contents



Description	1
Editor Biography	2
Editorial Advisory Board	2
Coverage of Content	3
Navigation Features	4
Key Abstracts & Noteworthy Biographies	5
International Contributors	20

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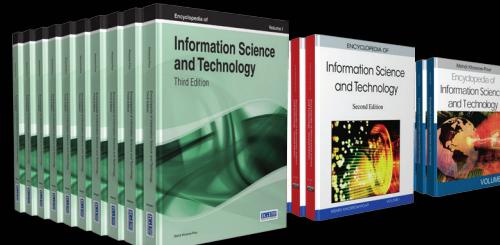
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Encyclopedia of Information Science and Technology, Fourth Edition

A Comprehensive 10-Volume Encyclopedia

Mehdi Khosrow-Pour, D.B.A. (Information Resources Management Association, USA)

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Since its debut in January 2005, the Encyclopedia of Information Science and Technology has acknowledged the need for a comprehensive compilation of the most forward-thinking research on the latest concepts and trends in the ever-evolving field of information science and technology. Over the past 12 years, two subsequent editions were released in answer to the rapid pace at which technology influenced and drove progress. Now, with these advancements affecting numerous aspects of contemporary society at an increasing rate, the need for yet another edition of this ground-breaking, landmark publication is apparent.

The Encyclopedia of Information Science and Technology, Fourth Edition is a commanding 10-volume set consisting of 705 completely new and original articles that impart a full range of applications and techniques, as well as critical perspectives on the impact of information science management and new technologies in modern settings. This authoritative content covers over 80 timely and trending categories, including but not limited to cloud computing, big data, educational technologies, management science, web technologies, and library science and administration, that spread across 11 major subject areas: Business, Computer Science, Education, Social Science, Library Science, Healthcare, Media and Communications, Security, Engineering, and Environmental Science.

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proves its convenience in an easy to navigate format. Two different tables of content are compiled at the beginning of each volume and each article is sorted into categories relevant to its topical coverage. Included within these articles are over 2,000 charts, graphs, tables, and formulae to be used as illustrative examples when applicable, as well as approximately 5,000 key terms and their concise definitions. An exhaustive list of references, as well as additional reading sections consisting of sources that complement the topical coverage within the article, are also provided for the benefit of scholars, students, and researchers looking to improve upon their own research. With each article submitted to a double-blind peer-review process, researchers are guaranteed accurate, original content to supplement their study.

For professionals, researchers, academicians, and practitioners the pioneering content contained within this Encyclopedia is invaluable. With its discussion and presentation of potential opportunities, prospective solutions, and future directions in the field, it is a fundamental reference source for all those who wish to improve upon and further research in information science. It is an essential addition to libraries of every discipline, including academic, medical, corporate, and joint-use. Not only will this well-established publication benefit faculty and students, but it will also assist the entire academic community with staying abreast of the latest technology-driven changes.



Editor Biography

The **Encyclopedia of Information Science and Technology, Fourth Edition** is edited by the esteemed Dr. Mehdi Khosrow-Pour, who also edited the first three editions of the renowned *Encyclopedia of Information Science and Technology*. As the author/editor of more than 50 books in information technology management, Dr. Khosrow-Pour lends over 30 years of expertise to this prominent publication.

Mehdi Khosrow-Pour, D.B.A. received his Doctorate in Business Administration from the Nova Southeastern University (Florida, USA). Dr. Khosrow-Pour taught undergraduate and graduate information system courses at the Pennsylvania State University – Harrisburg for almost 20 years. He is currently Executive Editor at IGI Global (www.igi-global.com). He also serves as Executive Director of the Information Resources Management Association (IRMA) (www.irma-international.org), and Executive Director of the World Forgotten Children Foundation (www.world-forgotten-children.org). He is also the Editor-in-Chief of the *Journal of Global Information Management*, *International Journal of Open Source Software and Processes*, *International Journal of Green Computing*, *International Journal of Digital Library Systems*, *International Journal of E-Entrepreneurship and Innovation*, *International Journal of Natural Computing Research*, *International Journal of Art, Culture and Design Technologies*, *International Journal of Signs and Semiotic Systems*, and *International Journal of Disease Control and Containment for Sustainability*, and has authored more than 50 articles published in various conference proceedings and scholarly journals.

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- Charts, graphs, tables, and formulae are included as illustrative examples whenever appropriate
- A discussion of future research opportunities and emerging trends
- A conclusion to discuss the overall coverage of the article and present concluding remarks
- An extensive list of references so that readers can benefit from the sources cited within the text
- A key terms and definitions section provides at least 7 to 10 terms related to the topic of the article with a clear and concise definition for each term



"The **Encyclopedia of Information Science and Technology, Fourth Edition** is an ample compendium of current knowledge combining a wide spectrum of basic and advanced disciplines. In ten volumes containing over ten thousand words the Encyclopedia comprises comprehensive and thorough research-based essays with emphasis on recent advances in selected fields, including communication and information sciences, computing and informatics, engineering, health, and other disciplines. This publication presents itself as an invaluable tool for various experts, academic and industrial researchers, and graduate students. This publication should become a part of libraries in the academic, corporate, and public institution environments."



Anna Ursyn,
University of Northern Colorado



Artificial Intelligence

Chapter 12: Automatic Emotion Recognition Based on Non-Contact Gaits Information

Jingying Wang, Institute of Psychology, Chinese Academy of Sciences, China; Baobin Li, University of Chinese Academy of Sciences, China; Changye Zhu, University of Chinese Academy of Sciences, China; Shun Li, University of Chinese Academy of Sciences, China; and Tingshao Zhu, Institute of Psychology, Chinese Academy of Sciences, China

Automatic emotion recognition was of great value in many applications, however, to fully display the application value of emotion recognition, more portable, non-intrusive, inexpensive technologies need to be developed. Except face expression and voices, human gaits could reflect the walker's emotional state too. By utilizing 59 participants' gaits data with emotion labels, we train machine learning models that are able to "sense" individual emotion. Experimental results show these models work very well, proved that gait features are effective in characterizing and recognizing emotions.

Chapter 23: Trust and Decision-Making in Turing's Imitation Game

Huma Shah, Coventry University, UK and Kevin Warwick, Coventry University, UK

Trust is an expected certainty in order to transact confidently. However, how accurate is our decision-making in human-machine interaction? In this chapter we present evidence from experimental conditions in which human interrogators used their judgement of what constitutes a satisfactory response trusting a hidden interlocutor was human when it was actually a machine. A simultaneous comparison Turing test is presented with conversation between a human judge and two hidden entities during Turing100 at Bletchley Park, UK. Results of post-test conversational analysis by the audience at Turing Education Day show more than 30% made the same identification errors as the Turing test judge. Trust is found to be misplaced in subjective certainty that could lead to susceptibility to deception in cyberspace.

Assistive Technologies

Chapter 28: A Disability-Aware Mentality to Information Systems Design and Development

Julius Nganji, University of Ottawa, Canada

With the proliferation of information technology devices also comes a massive increase in the number of information systems that are developed to meet the demands of users. By default, designers and developers of information systems tend to design for users without disabilities. The consequences for people with disabilities are enormous. This chapter aims to propose a disability-aware approach to information systems design that advocates that stakeholders consider the needs of people with disabilities throughout development. This aim is achieved by reviewing some of the difficulties encountered by people with disabilities when interacting with information systems, proposing a disability-aware approach and examining how this could be practically implemented through e-learning design.

Big Data

Chapter 33: Challenges for Big Data Security and Privacy

M. Govindarajan, Annamalai University, India

Security and privacy issues are magnified by the volume, variety, and velocity of Big Data, such as large-scale cloud infrastructures, diversity of data sources and formats, the streaming nature of data acquisition and high volume inter-cloud migration. In the past, Big Data was limited to very large organizations such as governments and large enterprises that could afford to create and own the infrastructure necessary for hosting and mining large amounts of data. Today, Big Data is cheaply and easily accessible to organizations large and small through public cloud infrastructure. The purpose of this chapter is to highlight the Big Data security and privacy challenges and also presents some solutions for these challenges, but it does not provide a definitive solution for the problem. It rather points to some directions and technologies that might contribute to solve some of the most relevant and challenging Big Data security and privacy issues.

Chapter 36: Mining Big Data and Streams: Challenges, Systems and Applications

Hoda Abdelhafez, Suez Canal University, Egypt

Mining big data is getting a lot of attention currently because the businesses need more complex information in order to increase their revenue and gain competitive advantage. Therefore, mining the huge amount of data as well as mining real-time data needs to be done by new data mining techniques/approaches. This chapter will discuss big data volume, variety and velocity, data mining techniques and open source tools for handling very large datasets. Moreover, the chapter will focus on two industrial areas telecommunications and healthcare and lessons learned from them.

Biomedical Engineering

Chapter 44: The Principle and Process of Digital Fabrication of Biomedical Objects

S.H. Choi, The University of Hong Kong, Hong Kong; H.H. Cheung, The University of Hong Kong, Hong Kong; and W.K. Zhu, The University of Hong Kong, Hong Kong

Biomedical objects are used as prostheses to repair damaged bone structures and missing body parts, as well as to study complex human organs and plan surgical procedures. They are, however, not economical to make by traditional manufacturing processes. Researchers have therefore explored the multi-material layered manufacturing (MMLM) technology to fabricate biomedical objects from CAD models. Yet, current MMLM systems remain experimental with limited practicality; they are slow, expensive, and can only handle small, simple objects. To address these limitations, this chapter presents the multi-material virtual prototyping (MMVP) technology for digital fabrication of complex biomedical objects cost-effectively. MMVP integrates MMLM with virtual reality to fabricate biomedical objects for stereoscopic visualisation and analyses to serve biomedical engineering purposes. This chapter describes the principle of MMVP and the processes of digital fabrication of biomedical objects. Case studies are presented to demonstrate these processes and their applications in biomedical engineering.

Business Information Systems

Chapter 78: Strategic Information Systems Planning: Implementing a Digital Strategy

Maria Kamariotou, University of Macedonia, Greece and Fotis Kitsios, University of Macedonia, Greece

Businesses respond to the businesses' environment uncertainty. Strategic Information Systems Planning (SISP) support this effort. Information Systems are connected with business strategy, management skills, decision making and aim to increase competitive advantage. Also, other studies have concluded that there is a positive relationship between SISP and firm performance. The aim of this chapter is to present a holistic approach in order to investigate the significance of SISP process, to highlight phases that contribute to a greater extent of success and to draw conclusions concerning the successful implementation of digital strategy in firms and especially in SMEs which are an important part of the economies of developing countries.

Civil Engineering

Chapter 84: Digital Animation for Representing Architectural Design

Roberta Spallone, Politecnico di Torino, Italy

Since the late Nineties digital movies are emerging as one of the main methods for submission of architectural designs at international competitions, public presentations and shares on websites of contemporary masters. The chapter highlights how the ability to access the fourth dimension, through the construction of a sequence of images, constitutes a specific prerogative of digital representation, which goes beyond the static constraint imposed by conventional methods of representation. The author investigates on the methods, techniques and languages of the fourth-dimensional communication of architecture, unexplored area of research thus far, already the subject of her previous studies, relating them with the masters' personal poetics. The chapter also provides analysis and critiques of the case studies collected by the author from the beginning of the phenomenon due both to the changing technologies and the emerging specific languages.

Cloud Computing

Chapter 99: Understanding Cloud Computing in a Higher Education Context

Lucy Self, University of Sussex, UK and Petros Chamakiotis, University of Sussex, UK

The study, which is qualitative and exploratory in nature, involved an innovative methodological approach, drawing on interviews with three groups of participants: (a) members of a global, Fortune 100 technology company supplying cloud solutions; (b) members of a selected UK university's IT department implementing cloud solutions; and (c) students from the same UK university using cloud solutions. The findings improve understanding around cloud solutions in the higher education context by unpacking—through a qualitative thematic analysis approach—relevant themes that inform the extant information systems literature.

Chapter 101: Virtualization as the Enabling Technology of Cloud Computing

Mohamed Firdous, University of Moratuwa, Sri Lanka

Cloud computing is the newest paradigm in computing that turned upside down the way of resource provisioning and payment. Cloud computing improves the resource utilization through virtualization enabling both customers as well as service providers to reap the benefits. Thus, virtualization is the enabling technology that made this revolution possible. Through virtualization, it is possible to host multiple independent systems on a single hardware without interfering with each other. Server virtualization techniques can be grouped based on how the underlying hardware and operating systems are presented to the users. In this chapter, the author takes an in depth look at how different virtualization has been implemented along with their security and quality of service issues.

Computer Simulation

Chapter 108: Data Visualization Strategies for Computer Simulation in Bioelectromagnetics

Akram Gasmelseed, Qassim University, Saudi Arabia and Ali Alharbi, Qassim University, Saudi Arabia

Bioelectromagnetics is a branch of science that examines how living organisms interact with electromagnetic fields. In a broader sense, it is a discipline that spans the fields of signal processing, electromagnetics, medical imaging, physiology, medical physics, anatomy, occupational and environmental health, behavioral, and computer sciences. Due to its provision of interactive and flexible programming environment, this chapter describes a LabVIEW based data visualization system that has been implemented and used in bioelectromagnetics simulations.

Criminal Science and Forensics

Chapter 119: Uncovering Limitations of E01 Self Verifying Files

Jan Krasniewicz, Birmingham City University, UK and Sharon Cox, Birmingham City University, UK

In computer forensics, it is important to understand the purpose of evidence file formats to maintain continuity of acquired data from storage devices. Evidence file formats such as E01 contain embedded data such as Cyclic Redundancy Check (CRC) and hash values to allow a program to verify the integrity of the data contained within it. Students on computer forensics courses need to understand the concepts of CRC and hash values as well as their use and limitations in evidence files when verifying acquired data. That is the CRC and hash values in evidence file only verify the acquired data and not the evidence file per se. This important difference in E01 files was highlighted by showing students an anomaly in E01 files where certain bytes can be changed in E01 files without detection by computer forensic software using the embedded CRC and hash values. The benefit to students is that they can see the advantages of self verification and limitations of what is verified giving the opportunity for a deeper understanding of evidence files and good practice.

Curriculum Development and Instruction

Chapter 134: Screencasts and Learning Styles

Rui Jesus, CESPU, Instituto de Investigação e Formação Avançada em Ciências e Tecnologias da Saúde, Portugal

In this chapter, the emphasis is on the different sensory modalities by which students prefer to perceive stimuli from the outside. If well planned and recorded, screencasts can include text, images, diagrams, audio, video and simulations, thus aiming to reach several learning modalities. This chapter explores the relation between screencasts and sensory preferences (measured by the VARK questionnaire), in a sample of nursing students. The data was analyzed with descriptive and inferential statistics methods. The majority of these students were multimodal (61.4%), as opposed to unimodal (38.6%), and screencasts were found to be more appealing to the former, and face-to-face classes were more appealing to the latter.

Customer Relationship Management

Chapter 141: Optimizing Cloud Computing Costs of Services for Consumers

Eli Weintraub, Afeka Tel Aviv College of Engineering, Israel and Yuval Cohen, Afeka Tel Aviv College of Engineering, Israel

Minimization of cloud computing cost depends on the technological infrastructure operated by providers. Cloud computing services are composed of services organized according to a hierarchy of software services, platforms and infrastructures. Providers offer software services as bundles of services which include software, platform and infrastructures.

Bundling prevents customers from splitting their service purchases between different providers. Bundling policy is likely to change in the long run since it contradicts economic competition. This paper assumes that in the future market forces will push providers to act in a free competitive market. The proposed model is aimed at the potential customer who wishes to find the optimal combination of service providers which minimizes his costs. The model suggests two possible strategies for implementation in organizations.

Cyber and Network Security

Chapter 144: Piracy and Intellectual Property Theft in the Internet Era

Shun-Yung Wang, University of South Florida St. Petersburg, USA and Jeremy McDaniel, Principal Financial Group, USA

Stealing ideas is not something new, but stealing and transporting ideas in a massive amount has become possible in the era of the Internet, in which this group of incidents emerged rapidly. Based on the frameworks of criminological theory/thesis, this chapter intends to elaborate intellectual property theft and piracy emerged in the cyberspace. Contemporary cases of intellectual property theft and piracy are used to illustrate the blurred line between victims and offenders, especially in the era of Internet. The impacts of related information technology should be carefully appraised, as more and more intellectual properties are in digital format.



Yigal Rosen, Harvard University, USA

Yigal is a Senior Research Scientist in The Vice Provost for Advances in Learning (VPAL) at Harvard University and a Lecturer at Harvard Graduate School of Education.

He leads the Harvard VPAL Research Team that advances big data research initiatives in higher education, such as the use of data from HarvardX

Massively Open Online Courses and Harvard's learning platform Canvas. The interdisciplinary team is comprised of researchers from computer science, statistics, data science and educational psychology fields.

Prior to joining Harvard he was a Senior Research Scientist at Pearson, leading research and development of innovative learning and assessment technologies of higher-order skills, including PISA, NAEP and PARCC programs. He obtained his Ph.D. degree in Education from the University of Haifa, being the youngest recipient of a doctoral degree in the University.

Yigal was a post-doctoral fellow at Harvard University Graduate School of Education and at Tel Aviv University School of Education. Yigal is a leading editor of the recently published book, "Handbook of Research on Technology Tools for Real-World Skill Development".

Ming Chiu, Purdue University, USA

Ming Chiu is Charles Hicks Professor of Educational Psychology and Research Methodology at Purdue University. He earned his bachelors in computer science at Columbia University, masters in interactive technology at Harvard, and PhD in Education at UC-Berkeley. He serves on the advisory board of mainland China's Ministry of Education's National Evaluation of Primary and Secondary Schools. He invented two statistics methods: statistical discourse analysis (SDA) and multilevel diffusion analysis (MDA). SDA models online and face-to-face conversations, showing how students' social metacognitive skills enhance their micro-creativity. MDA shows how ideas spread through populations and detects corruption in the music industry. He also showed how economic growth, inequalities and cultural values affect nearly 500,000 students learning in 65 countries. Supported by 26 grants totaling over \$4.5 million, he disseminated his research through 162 publications (including 87 journal articles), 3 television broadcasts, 17 radio broadcasts, and 148 news articles in 21 countries and regions.



Cyber Crime, Cyber Bullying, and Digital Terrorism

Chapter 150: The Nature, Extent, Causes, and Consequences of Cyberbullying

Michelle Wright, Masaryk University, Czech Republic

Raised in a digitally connected world, children and adolescents do not remember a time in which new media and technology were not such integral parts of their lives. There are many opportunities afforded by new media and technology, such as the ability to communicate efficiently with just about anyone and having access to an assortment of information at their fingertips. Cyberbullying has increased over the years, due to children's and adolescents' increasing usage of new media and technology. Further attention has been given to cyberbullying because of high profile cases of victims committing suicide as a consequence of being targeted by these behaviors. The purpose of this chapter is to describe the nature, extent, causes, and consequences of cyberbullying as well as cultural differences in these behaviors and theoretical underpinnings. Concluding this chapter is recommendations for future research and public policy.

Data Mining and Databases

Chapter 179: Twitter Data Mining for Situational Awareness

Marco Vernier, University of Udine, Italy; Manuela Farinosi, University of Udine, Italy; and Gian Luca Foresti, University of Udine, Italy

The most recent catastrophic events, from the 2010 Haiti earthquake to the devastating 2013 Colorado floods, have shown a strong adoption of social media platforms by ordinary people. The data and meta-data produced by the users during and after the extra-ordinary situations could have enormous potentialities if integrated with the traditional systems for emergency management and used for hyperlocal situational awareness. The great majority of the current literature is focused on Twitter for several reasons strictly linked to the architectures and practices of use of the platform itself. It is possible to classify the existing systems based on the analysis of Twitter data at least in three different categories: 1) semantic systems; 2) meta-data systems; and 3) smart self-learning systems. In this contribution, a review of the most significant and important tools used to analyze Twitter data will be presented and an innovative and smart solution will be proposed for future development.

Decision Support Systems

Chapter 183: Decision Filed Theory, its Research Trends and Applications

Lan Shao, University of Oulu, Finland and Jouni Markkula, University of Oulu, Finland

Human decision making theories and formal models are increasingly used for developing advanced ICT based intelligent systems and services. Decision Filed Theory (DFT) is one of the decision making theories that has significant potential for practical applications in real-world decision making situations. Successful empirical studies have shown that DFT theory is able to explain human decision making behaviour in real situations and the model can be applied as a basis for ICT system and service design. In this article, we present the results of a Systematic Literature Review that we conducted for analysing and synthesizing the evidence of DFT development and its validated usage in different application areas. The results show that the interest in DFT and its applications has grown strongly during the last years. The basic model has been extended to cover more complex decision making situations and its applications have been widening.

Educational Technologies

Chapter 207: Challenges in Developing Adaptive Educational Hypermedia Systems

Eileen O'Donnell, Trinity College Dublin, Ireland and Liam O'Donnell, Dublin Institute of Technology, Ireland

The purpose of Adaptive Educational Hypermedia Systems (AEHS) is to provide each learner with learning experiences which have been specially tailored to their specific learning requirements. While the concept of AEHS appears promising; AEHS are very complex systems to design and develop. This article reviews a few of the challenges encountered in the design and development of these complex systems and some of the challenges encountered by educators who propose to use AEHS with their students. A number of the skills required by educators to develop positive learning experiences are discussed. In order to successfully use AEHS educators must decide on what student characteristics to base the adaptive elements of the course. Educators may feel challenged to show the impact that AEHS can have on the learning experience. Educators may have a dilemma in deciding to allow or not to allow (i) students access to their user model and (ii) students to edit their user model. Further research is required to explore why AEHS have not yet impacted education as initially expected.



“The *Encyclopedia of Information Science and Technology, Fourth Edition* is a comprehensive work of critical contemporary topics at the centre of information science and technology today. A key strength is its cross-diversified disciplines for IT professionals.”

Professor Nilmini Wickramasinghe

Professor-Director Health Informatics Management Epworth HealthCare and Deakin University, Australia

Chapter 229: 3D Printing Applications in STEM Education

Norman Gwangwava, Botswana International University of Science and Technology, Botswana and Catherine Hlahla, National University of Science and Technology, Pakistan

The chapter explores 3D printing technology at kindergarten (preschool), in the lecture room (BEng programme), and ready-to-use 3D printed products. In educational toy applications, the effect of poor product designs that do not meet the children's dimensional and safety requirements can lead to injuries, development of musculoskeletal disorders and health problems, some of which may be experienced by the children when they grow up. In order to address the problem of poor design, measurements of anthropometric dimensions from male and female children, aging from 6 to 7 years old were taken and concepts for educational toys were then generated. Other practical applications of the 3D printing technology explored in the chapter are lecture room demonstrations, prototyping of design projects and a web-based mass-customization of office mini-storage products.

Electronic Commerce

Chapter 251: Use of Bitcoin for Internet Trade: Architecture, Working and Security Challenges

Sadia Khalil, NUST School of Electrical Engineering and Computer Science, Pakistan; Rahat Masood, NUST School of Electrical Engineering and Computer Science, Pakistan; and Muhammad Shibli, VisionIT, USA

Despite being widely adopted by various large scale businesses, Bitcoin transactions are still exposed to many known as well as zero-day attacks due to various vulnerabilities being exploited by the malicious entities. In order to achieve reliable and secure transactions, extensive research needs to be carried out to critically examine Bitcoin architecture and its level of security. In this regard, this chapter presents a holistic analysis of Bitcoin architecture and a survey of the attacks prevalent to its transactions. As an evaluation of the Bitcoin system, a comparison of different crypto-currencies has been presented, based on their features, possible attacks, disadvantages and the advantages which they possess over Bitcoin.

Entrepreneurship

Chapter 262: Entrepreneurship Concept, Theories, and New Approaches

José Manuel Saiz-Alvarez, Tecnológico de Monterrey, Mexico and Martín García-Vaquero, Nebrija University, Spain

This chapter deals with the concept and theories of entrepreneurship that can be defined as the type of business strategy focused on the creation of new business ideas, jobs, social wealth, and profit by optimizing the use of productive and commercial resources. Neoclassical and New Keynesian theories are briefly analyzed in the chapter, as well as Psychological-based and Modern theories, including the Jack-of-all Trades Theory, O-Ring Theory, Resources- and Capabilities-based Theory, and Theory of the Optimal Triangle. The chapter also includes both social and solidarity-based entrepreneurship strategies, alongside the traditional classification made on this concept.

Yu-Jin Zhang, Tsinghua University, China

Yu-Jin Zhang received the Ph.D. degree from the State University of Liège, Liège, Belgium, in 1989. He was post-doc fellow at the Delft University of Technology, Delft, the Netherlands, 1989 ~ 1993. He is professor of Image Engineering at Tsinghua University, Beijing, China, since 1997. He has spent one sabbatical year (2003) as visiting professor at Nanyang Technological University, Singapore. He is the author of more than 500 research papers and 34 books, including three monographs: "Image Segmentation", "Content-based Visual Information Retrieval", "Subspace-based Face Recognition", as well as three edited volumes: "Advances in Image and Video Segmentation", "Semantic-Based Visual Information Retrieval", "Advances in Face Image Analysis: Techniques and Technologies". He was the program chair of ICIG'2000, ICIG'2002, ICIG'2007, ICIG'2009, ICIG'2011, ICIG'2013, ICIG'2015. He is the program chair of ICIP'2017. He is the director of academic committee of the China Society of Image and Graphics, a senior member of IEEE, and a fellow of SPIE.



Diane Barrett, Bloomsburg University of Pennsylvania, USA

Dr. Diane Barrett holds a PhD in business administration with an information security specialization from Northcentral University. She is a Certified Information Systems Security Professional (CISSP), and Digital Forensic Certified Practitioner holding many additional industry certifications including, ISSMP, NSA IAM/IEM, Paraben Certified Mobile Examiner, and many CompTIA certifications. Dr. Barrett has an extensive background and has

been involved in the IT industry for over 20 years, spending 7 years in software development before becoming involved in security and forensics. She is the President of NextGard technology, LLC and has done contract forensic and security assessment work for numerous years and held positions such as manager of research and training for Kroll's cyber division and forensic training director for Paraben Corporation. Dr. Barrett is the conference co-chair for the Conference on Digital Forensics, Security and Law as well as the President of the Digital Forensics Certification Board. Diane has been involved in collegiate-level forensic education through the development of curriculum and teaching at Bloomsburg University of Pennsylvania, American Military University, and the University of Advancing Technology. She has been a volunteer for ISC2 since 2007 in the areas of item writing and review for the CISSP and ISSMP exams. She has co-authored several security and computer forensics books including Security + Exam Cram, Virtualization and Forensics, and Cybercrime and Cloud Forensics: Applications for Investigation Processes.



The Fourth Edition of the *Encyclopedia of Information Science and Technology* follows the path remarkably opened by the former editions, updating an expressive, unequaled and unprecedented work around theoretical definitions and practical applications regarding these dynamic, fast-changing fields. A fundamental teamwork which enables knowledge application for decisions, planning and solutions proposition and implementation in all areas of scientific contribution, as its main themes - Information and Technology - reach all human organizational experiences."

Dr. George Leal Jamil, Informações em Rede, Brazil



Environmental Science and Agriculture



Chapter 270: Identification of Green Procurement Drivers and their Interrelationship using Fuzzy TISM and MICMAC Analysis

Surajit Bag, Tega Industries South Africa Pty Ltd, South Africa

The objective of the current study is to identify the leading green procurement drivers and identify the interrelationships using fuzzy total interpretive structural modeling and MICMAC approach. For the purpose of this study, twenty-five drivers were identified from existing literature which influences green procurement practices and finally refined through experts' opinion. The final fuzzy model consists of fuzzy relationships between one to one criteria. The key drivers which emerged from Fuzzy TISM and MICMAC analyses are Government policy and Regulations, Total Quality Environmental management, Management Support, Management Review, Continuous education of employees, Cross functional team building, Organization Culture, and Green process and Technology. The green procurement model may assist supply chain practitioners in better decision making and successful implementation of green procurement programs.

Gaming



Chapter 282: Application of Gamification to Blended Learning in Higher Education

Kamini Jaipal-Jamani, Brock University, Canada and Candace Figg, Brock University, Canada

The inclusion of digital game-based learning in instruction is challenging for educators to structure in higher education learning environments, often because of the lack of coherence with curriculum. Gamification is a recent DGBL strategy that enables the instructor to incorporate the motivational and engagement elements of games in ways that can be adapted to curriculum requirements. Gamification, supported with digital technologies such as web-based tools and learning management systems, offer the instructor the benefits of both face-to-face traditional instruction and online learning. Study findings indicate that the blended gamified learning environment motivated learners and promoted cognitive, skill, and attitude development.

Gender Diversity



Chapter 293: Gender Differences in Advertising Engagement. The Case of Facebook Ads

Eva Lahuerta-Otero, University of Salamanca, Spain and Rebeca Cordero-Gutiérrez, University of Salamanca, Spain

The importance and the attention that social media has gained is widely studied among the scientific community as their growth seems unstoppable. The rise of online advertising has made companies design new marketing plans to adapt both their strategic and tactic operations to meet multichannel customers' needs. Since social media marketing is a core part of any firms' marketing strategy, companies and organizations are starting to use Facebook Ads as a marketing tool. Therefore, the purpose of the study is to try to aim this gap by analyzing several Facebook campaigns in the education sector to discover which gender group reacts best to advertising.

Government and Law



Chapter 312: Mastering Electronic Government in the Digital Age

Kijpokin Kasemsap, Suan Sunandha Rajabhat University, Thailand

This article reveals the overview of electronic government (e-government); the adoption of e-government; the digital era governance (DEG) and new public management (NPM); and the significance of e-government in the digital age. E-government is the use of information and communications technology (ICT) to improve the activities of public sector organizations. E-government can open new opportunities for city and local governments to engage in governance by requiring the reforms of underlying working processes. The article argues that mastering e-government has the potential to enhance organizational performance and achieve strategic goals in the digital age.

Health Information Systems

Chapter 328: Software Evaluation from the Perspective of Patients and Healthcare Professionals

Rui Lopes Rijo, Polytechnic Institute of Leiria, Portugal and Domingos Alves, Ribeirão Preto Medical School of the University of São Paulo, Brazil

Healthcare software evaluation is a complex process. Specifically, in the health information systems, focusing on the patients' health and on the healthcare professionals' motivation is particularly important. Doctors, nurses and other healthcare professionals use software that indirectly affects the patients. Does software improve the patients' health, their satisfaction, or the healthcare professionals' commitment/job satisfaction? How can the impact of an information system be measured from the perspective of the patients, the doctors, the nurses or the supporting staff? Some relevant efforts have been made in the last years to measure healthcare software impact. By identifying the research questions and the most relevant works, as well as indicating the open research issue, this article is a revision of the literature on the subject.

High Performance Computing

Chapter 347: The Future of High-Performance Computing (HPC)

Herbert Cornelius, Intel Corporation EMEA, Germany

Today High-Performance Computing is also well recognized to be of strategic and economic value – HPC matters and is transforming industries. This article will discuss new emerging technologies that are being developed for all areas of HPC: compute/processing, memory and storage, fabric, I/O and software to address the ongoing challenges in HPC such as balanced architecture, energy efficient high-performance, density, reliability, sustainability, and last but not least ease-of-use. Of specific interest are the opportunities for the next frontier in HPC envisioned around the 2020 timeframe: ExaFlops computing. We will also outline the new and emerging area of High Performance Data Analytics, Big Data Analytics using HPC, and discuss the emerging new delivery mechanism for HPC - HPC in the Cloud.

Hospitality, Travel, and Tourism Management

Chapter 349: Augmented Reality for Tourist Destination Image Formation

Azizul Hassan, Cardiff Metropolitan University, UK

This conceptual paper synthesizes the functionalities of AR in tourism destination image formation. This study explores AR application aspects for tourism destination image formation while, placing them in an emerging tourism economy perspective with Bangladesh as the example. Results determine interrelatedness between tourist destination image formation and AR application. In the emerging tourism market scenario, the possibilities of AR application are unlimited but, the policy and structural capacities remain largely inadequate. Study upshots also show that, this technology convincingly creates better perceptions leading to positive tourist destination image.



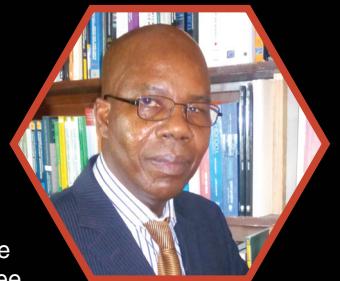
Kai Jakobs, RWTH Aachen University, Germany



Kai has been RWTH Aachen University's Computer Science Department (Chair of Communication & Distributed Systems) as a member of technical staff since 1985. He holds a PhD in Computer Science from the University of Edinburgh and is a Certified Standards Professional. His research interests and activities focus on various aspects of ICT standards and the underlying standardisation process. Kai is Vice President of the European Academy for Standardisation (EURAS). He is also founder and editor-in-chief of the "International Journal on Standardization Research", the "Advances in Information Technology Standards and Standardization Research" and the 'EURAS Contributions to Standardisation Research' book series.

Osarumwense Igusi, University of Benin, Nigeria

Osarumwense Igusi received his BSc degree in Building Construction, MSc degree in Industrial Development and MA degree in General Management from the Free University of Brussels in Belgium. An MPhil degree in Applied Science of Economics with research focus on 'International Management' from the Universite Catholique de Louvain, Louvain-La-Neuve, Belgium and a PhD degree in 'Management and Organisation' with research focusing on 'Cultural Dynamics in Management Practice from University of Stirling, UK. Osarumwense Igusi joined the University of Benin in 2013. For the past 25 years, he has been involved in basic and applied research, training and consultancy in the fields of Culture, Organization and Management. He was a Research Fellow at the Institute for Research on Intercultural Cooperation (IRIC), University of Maastricht-Netherlands, and Researched and lectured at Free University of Amsterdam, the Netherlands, Stirling Management School, University of Stirling, UK, and a Visiting Fellow to University of Nairobi-Kenya, University of Dar Es Salaam-Tanzania, and University of Zimbabwe. He also held the positions of Executive Director, Euro-African Management Research Centre, Brussels-Belgium; Cross-Cultural Research and Training Consultant to Scottish Enterprise; UK; Course Development Consultant, Maastricht School of Management, Holland; Human Capacity Development Adviser, European Centre for Development Policy Management (ECDPM) Maastricht, Holland.



Human-Computer Interaction

Chapter 373: Virtual Hoarding

Jo Ann Oravec, University of Wisconsin at Whitewater, United States

This article outlines hoarding issues involving virtual goods (including video and image files, digital documents, etc.) in the context of workplace and household settings. It covers “dark data” security issues and intellectual property concerns as well as matters related to information flow. Virtual hoarding issues may not seem to be critical given the decreased costs of on-site and backup storage as well as relatively-inexpensive storage facilities in the “cloud.” However, data that are not managed in terms of their formats, metadata, and substrata could certainly present issues for organizations; data that are inappropriately removed from the standard flow of information within organizations also present potential losses.

IT Research and Theory

Chapter 403: Exploring New Handwriting Parameters for Writer Identification

Verónica Aubin, Universidad Nacional de La Matanza, Argentina and Jorge Doorn, Universidad Nacional del Oeste, Argentina & Universidad Nacional de La Matanza, Argentina

The automatic processing of handwriting samples is part of the computational biometric. It applies qualitative and quantitative techniques by means of capturing, visualizing and analyzing handwriting. The main applications are writer identification and text understanding. Two significantly different situations appear: on line and off line data capturing. In the former the samples are obtained in a dedicated framework, where the writing instrument and the surface have several sensors. In the latter, the unique information available comes from the residues left on the paper. This chapter deals with the second situation. Some of these personal parameters may be estimated from the observable properties of the written text.

“The *Encyclopedia of Information Science and Technology, Fourth Edition*, is a recognized collection of sophisticated knowledge and high-quality research practices concerning information science and technology, and is contributed by distinguished scholars from all over the world.”



Dr. Kijpokin Kasemsap

Suan Sunandha Rajabhat University, Thailand

Human Resources Management

Chapter 378: Technology, Learning Styles, Values and Work Ethics of Millennials

Harish Chandan, Argosy University, Atlanta, USA

The widespread availability of the Internet and digital technology tools since the 1980's has created a “tech-savvy generation” of people called the Millennials, who quickly adopt the new information and communication technologies (ICT's) as soon as they are available. These new ICT's are changing the learning styles, values and work ethics of Millennials who represent the latest generational cohort to join the colleges, universities and the workplace. Born between 1981 and 1997, the Millennials in U.S.A. constitute about 30 to 35 % of the population and represent the majority of workforce (Pew Research Center, 2015). In U.S., Millennials have now surpassed the Baby Boomers (ages 52 to 70 years in 2016) and constitute the nation's largest generation segment (Fry, 2016). The universities have to update their teaching styles and student services and the corporations have to make changes to organizational practices to resonate with the Millennial generation.

Chapter 407: Immersing People in Scientific Knowledge and Technological Innovation through Disney's Use of Installation Art

Jonathan Lillie, Loyola University, USA and Michelle Jones-Lillie, Lillie Pad Studios, USA

This chapter argues that installation art is a powerful, but underused, method for presenting scientific knowledge and visions of technological innovation. It reviews Disney's extremely successful exhibits at the 64-65 fair as iconic examples of art installations designed to provide strong narrative experiences of technological innovation. Disney used different aspects of installation art to present powerful immersive installations as presentation of technological and scientific knowledge through multiple media. The goal is to identify general methods for conveying such knowledge to general, lay audiences in ways that might not only encourage greater understanding, but also inspire future generations toward scientific and technological discovery.

IT Security and Ethics

Chapter 422: Digital Video Watermarking using Diverse Watermarking Schemes

Yash Gupta, Maulana Abul Kalam Azad University of Technology, India; Shaila Agrawal, Maulana Abul Kalam Azad University of Technology, India; Susmit Sengupta, Maulana Abul Kalam Azad University of Technology, India; and Aruna Chakraborty, Maulana Abul Kalam Azad University of Technology, India

As the significance of the internet is increasing day by day so is the need of protecting the media over the internet. So in order to protect the copyright information of the media over the internet we use the technique of Watermarking. Watermarking is the process of embedding a watermark in the media and then extracting it for ownership verification. Different types of watermarking schemes exist in the world but we always look for techniques which are highly imperceptible and does not lead to loss of fidelity. Here the researchers have put forward a technique which instills different watermarking schemes to different set of frames.

Chapter 430: The Protection Policy for Youth Online in Japan: Towards an Evidence Based Youth Protection Policy

Nagayuki Saito, Ochanomizu University, Japan and Madoka Aragaki, Business Breakthrough University, Japan

The OECD committee adopted the “Recommendation on the Protection of Children Online” in February 2012. It recommended establishing an appropriate online environmental policy for children, based on actual data. Arising from the international movement, the Internet Literacy Assessment Indicator for Students (ILAS) and its tests were developed; this tool aims to ensure safe and secure Internet use among 15-year-old students. This study analyzes national research data from ILAS to explore the relationship between students’ backgrounds and online literacy. The results have revealed several political challenges, including the need for policies on educational awareness in low literacy areas, regional literacy differences, and the need to support children in learning to avoid risk.

Knowledge Management

Chapter 436: Indigenous Knowledge Systems: African Cultures and Management Philosophy

Osarumwense Igusi, University of Benin, Nigeria and Osaro Igbinomwanhia, University of Benin, Nigeria

This conceptual paper draws attention to the relevance of cultures to management philosophy with the purpose of contributing to a culturally viable practice of management in Africa. It has been shown that the different management theories in the form that they have been developed in the West may not fit culturally in Africa. However, it is unlikely to pay Africans to throw away all that the West has to offer. Rather, the process of appropriate management theorizing should be to reflect on the assumptions of Western management theories, compare Western assumptions about social and cultural values with African cultural values and rebuild the theories or models through experimentation. The use of anthropological and philosophical concepts in this context will help in development of appropriate management practice.

Hunter Hoffman, University of Washington, USA

Hunter Hoffman, Ph.D., is Director of the Virtual Reality Research Center at the University of Washington in Seattle. Hoffman is research scientist in Mechanical Engineering, and affiliate faculty in Radiology and Psychology. He conducts research at the University of Washington, Seattle Shriners Hospitals for Children Galveston, and Effat University in Jeddah Saudi Arabia. His graduate education was in Cognitive Psychologist specializing in human learning/memory and attention, and is one of the early pioneers applying virtual reality technology to difficult medical and psychological problems such as pain, phobias, and Post-Traumatic Stress Disorder. Hoffman and Patterson co-originated the technique of using virtual reality pain distraction for severe burn patients. Hoffman has designed several virtual worlds (e.g. SnowWorld pain distraction, part of the Smithsonian Cooper-Hewitt National Design Museum Triennial), and he has designed and developed a number of custom original hardware technologies, such as photonic fiberoptic magnet-friendly VR goggles that can be used during fMRI brain scans. Hunter Hoffman was named one of the top “fast 50” innovators of the next 10 years (www.fastcompany.com/fast50_06/index.html).



Dr. Laura Aymerich-Franch, CNRS-AIST JRL (Joint Robotics Laboratory), AIST, Japan



Laura Aymerich-Franch is a Marie Curie IOF postdoctoral fellow at CNRS-AIST JRL (Joint Robotics Laboratory). Previously, she was a Fulbright postdoctoral scholar at Virtual Human Interaction Lab at Stanford University. Laura earned a PhD cum laude on Audiovisual Communication and Advertising (2010) from Universitat Autònoma de Barcelona (UAB), where she was part of the Image, Sound, and Synthesis Research Group (GRIS). She was also a lecturer at UAB (2006-2011) and a visiting research fellow at iCinema, Centre for Interactive Cinema Research at University of New South Wales in Sydney (2009). Her area of expertise is Media Psychology. I study self-representation in artificially created environments and the consequences of mediated embodiment in virtual reality and humanoid robots.

Library Science and Administration

Chapter 452: Changing Expectations of Academic Libraries

Jennifer Joe, Western Kentucky University, USA

The digital age has been presented as a stark contrast to everything that libraries have had to deal with prior to now. While it is true that academic libraries have had to change to stay relevant in the digital age, the changes are not as severe as was once thought. When libraries embrace a few simple changes and start thinking outside the box when it comes to their employees, their resources, and their mission statements, they begin to meet the challenges that the digital age presents, and will continue to thrive in the new world presented by electronic materials, while remaining true to their spirit of information exchange and knowledge sharing.

Chapter 454: Massive Digital Libraries (MDLs): Issues and Outcomes from the Mass-Digitization of Books

Andrew Weiss, California State University, Northridge, USA

Massive Digital Library (MDL) is a term coined to define a class of digital libraries gathering mass-digitized print books and monographs, which rival the size of brick-and-mortar libraries. Specific examples of MDLs, including Google Books, HathiTrust, DPLA, Internet Archive, et al., are presented. The issues raised by MDLs include the following: mass-aggregation of digital content and the ability to maintain source-material accuracy and veracity; copyright, Fair Use and the mass-digitization of materials not in the Public Domain; and disparities in the level of diversity, especially with regard to Spanish-language, Japanese-language, and Hawaii-Pacific materials. Finally, the impact of MDLs on Digital Humanities, especially with regard to the Google Books digital corpus and the Google Ngram Viewer, will be investigated.

Management Science

Chapter 489: Empirical Verification of the Performance Measurement System

Aleksander Janeš, University of Primorska, Slovenia

In their endeavor to increase profits, companies usually become aware that this is predominantly the result of employee competence and satisfaction, processes excellence and customer's satisfaction. Based on that assertion, companies integrate different managerial tools in the performance measurement system (PMS) and therefore in their management system. One of the most dominant managerial tools is the Kaplan and Norton's balanced scorecard (BSC). In this research, the approach that represents the basis for further work in the field of research in PMSs of companies, with the use of econometric tools, was empirically tested and developed.

Marketing

Chapter 499: The Impact of Artificial Intelligence and Virtual Personal Assistants on Marketing

Christina McDowell, University of Alaska Anchorage, USA; Edward Forrest, University of Alaska Anchorage, USA; and Bogdan Hoanca, University of Alaska Anchorage, USA

Rather than simply targeting consumers, the marketing effort will also be directed at the algorithms controlling the consumers' virtual personal assistants (VPAs). Rather than exploiting human desires and weakness, marketing will need to focus on meeting the user's actual needs. The level of customer satisfaction will be even more critical as marketing will need to focus on establishing and maintaining a reputation in competition with those of similar offerings in the marketplace. This entry concludes with thoughts on the long-term implications, exploring the role of customer trust in the adoption of AI agents, the security requirements for agents and the ethical implications of access to such agents.

Medical Technologies

Chapter 512: Neuroscience Technology and Interfaces for Speech, Language and Musical Communication

Dionysios Politis, Dept. of Informatics, Aristotle University of Thessaloniki, Greece; Miltiadis Tsalighopoulos, School of Medicine, Aristotle University of Thessaloniki, Greece; and Georgios Kyriafinis, AHEPA University Hospital, Greece

The use of bionic devices clinched with synapses of the nerves does not merely mingle input activity to brain activity, but also it provides a virtual channel for augmenting and manipulating speech communication, language communication and even further musical communication. The electromechanical parameters, the medical practices and the learning potential for this new world of augmented Human Computer Interaction platforms and devices are examined under the prism of audio communication.

Mobile and Wireless Computing

Chapter 538: Mobile Applications for Automatic Object Recognition

Danilo Avola, Sapienza University, Italy; Gian Luca Foresti, University of Udine, Italy; Claudio Piciarelli, University of Udine, Italy; Marco Vernier, University of Udine, Italy; and Luigi Cinque, Sapienza University, Italy

The vision based applications for the Automatic Object Recognition (AOR) play a key role since enable users to interact with the world around them in innovative way that makes more productive and profitable their entertainment, learning and working activities. The proposed chapter is divided into four sections. The first one, Background, explores the most recent works in AOR mobile applications highlighting the feature extraction processes and the implemented classifiers. The second one, MV Development Technologies, provides an overview of the current frameworks used to support the mobile AOR applications. The third one, Future Research Trends, discusses the aims of the next generation of AOR applications. Finally, Conclusion, concludes the chapter.

Chapter 550: Wireless Implant Communications Using the Human Body

Assefa Teshome, Victoria University, Australia; Behailu Kibret, Victoria University, Australia; and Daniel Lai, Victoria University, Australia

This chapter first examines a new analytical electromagnetic model that uses galvanically coupled intrabody communication (IBC). Frequencies ranging from hundreds of kHz up to a few MHz are considered under quasi static assumptions. The model is unified in the sense that it can be applied to any part of the body (i.e., head, torso, limbs etc.). The security and low power consumption of IBC are also apparent in this model. The path loss characterisation of IBC implants shows lower values compared to their MICS counterparts. In addition, the chapter also elaborates on the use of human body as antenna. A scenario where an RF current is fed by a tiny toroidal inductor clamped around tissues in the ankle is studied.

Robotics

Chapter 596: TeleSurgical Robotics – A Kinematic Perspective

Sajid Nisar, National University of Sciences & Technology, Pakistan and Osman Hasan, National University of Sciences & Technology, Pakistan

Telesurgical robotics came forward to assist surgeons and made surgeries even further innovative, safer and efficacious. Kinematics - a fundamental and foremost manipulator design step - is considered as the lynchpin of performance of a surgical robot. It plays a decisive role and defines the capabilities and viability of a robot vis-à-vis its applications. This chapter tries to understand the kinematic design approaches in practice so far and discusses their features and potential shortcomings. Some of the notable kinematic structures are explained in detail and an all-inclusive consideration to the kinematic aspects of the existing designs has been given. Based on the key challenges identified, possible solutions are suggested followed by future research directions and conclusions.

Social Networking and Computing

Chapter 601: Adolescents' Food Communication in Social Media - A Theoretical Inquiry of the Why and How

Christopher Holmberg, University of Gothenburg, Sweden

Studies show that the dissemination and sharing of food content is prevalent in these channels. Not only do messages of food serve a symbolic purpose in these online platforms, but this communication might also affect adolescents in both positive and negative ways in regards to health. Visual food messages can affect brain areas associated with appetite and influence dietary behaviors among adolescents similar to advertisements. The objective with this article is to elucidate the complex and interwoven relationship between food and nutrition, social media, and adolescents from a health communication perspective. The article draws upon empirical studies and results, as well as related conceptual literature. Methodological and theoretical explanations are discussed as well as practical implications. Future research directions are also outlined.

Phil Crosby, Curtin University, Australia

Dr. Phil Crosby works for CSIRO Astronomy & Space Science (CASS) where he is Assistant Director: Western Australia. He manages CASS strategic planning, and is a Major Projects Specialist. He also supports the Square Kilometre Array Project (UK) as Industry Engagement Officer. Phil trained with British Telecom as electronics and communications engineer, ran his own industrial electronics firm, and then managed an environmental sensor instrumentation business. In 1994, he joined the National Association of Testing Authorities,

Australia (NATA) in the field of technical management standards, rising to Business & Strategy Manager. He established offices in Korea, India, Chile, and Turkey, and led several major on-site technical studies, including an impact assessment of Antarctic science, and a review of the Australia Nuclear Science & Technology Organisation (ANSTO). In 2005, Phil was an embedded executive in Boeing, in the role of Manager, Industrial Participation Strategy for Australia. Phil has published several papers concerning mega-science project management, and is a member of numerous space-related groups, committees, and panels. His PhD concerns success drivers for science/engineering mega-projects.

Mark Ragan, The University of Queensland, Australia

Mark Ragan is Professor of Computational Genomics at the Institute for Molecular Bioscience, and an Adjunct Professor in the School of Information Technology & Electrical Engineering, both at the University of Queensland in Brisbane, Australia. He was founding Director of the Australian Research Council (ARC) Centre of Excellence in Bioinformatics (2003-2015), and co-founder of QFAB Bioinformatics, a multi-institutional, multi-sectorial partnership focused on service provision. Mark is a graduate of the University of Chicago (Biochemistry) and Dalhousie University (Biology). He was employed by National Research Council Canada (1978-2000) and was a Fellow of Canadian Institute for Advanced Research (1994-2000) before relocating to Australia. Core technologies in his research group include integration of large bioscience data, scalable algorithms on trees and networks, bioinformatic workflows, machine learning, high-performance and data-centric computing. Mark is also involved in national and international infrastructure initiatives in genomics, computing, data and bioinformatics services.

Chapter 606: The Dual Nature of Participatory Web: How Misinformation Seemingly Travels

Sameer Kumar, University of Malaya, Malaysia

Web 2.0 is an internet technology that facilitates collaboration on the World Wide Web (WWW). As a direct product of people's freedom of expression, Web 2.0 technology has given birth to a new media – the Social Media that is redefining the way people collaborate and express themselves. By studying surveys in three specific aspects of its impact – social service, politics and as a vehicle of misinformation and through content analysis of some online comments, the author argues that social media is capable of transmitting both good and bad information. In the article, an illustration of how misinformation through video seemingly travels, is also presented.

Chapter 625: Why it is Difficult to Disengage from Facebook: The Contribution of the Attachment Theory and the Actor Network Theory

Sonda Bouattour Fakhfakh, University of Tunis El-Manar, Tunisia

The huge popularity of social network sites like Facebook gave rise to numerous studies exploring the prerequisites and consequences of FB use. This article does not deviate from this direction. It offers a theoretic attempt to analyze the reasons of attachment to FB but through another perspective: the disengagement phenomenon. The theoretical framework is based on the Attachment Theory and the Actor Network Theory. Assuming that FB allows the satisfaction of the innate attachment need and that there is a social and technical interaction between users and the FB structure, the present analysis investigates the relations between user attachment style and FB use and between FB user and the FB platform (hardware and software). The aim here is not to reject (or not) some formulated hypothesis, but to develop a theoretical frame from the existing theories. The argument is that human/human and human/non-human attachment could explain why users find it very difficult to disengage even though they are willing to do so and suffering from being invaded by FB.

Sociology

Chapter 636: The Networked Effect of Children and Online Digital Technologies: The Case of Children and Online Digital Technologies

Teresa Sofia Castro, University of Minho, Portugal; António J. Osório, University of Minho, Portugal; and Emma Bond, University Campus Suffolk, UK

Within the scope of how technology impacts on society three theoretical models: the social shaping of technology (SST), social construction of technology (SCOT) and the Actor-Network theory (ANT) are frameworks that help rethink the embeddedness of technology within society, once each is transformed and transformative of the other. More attention will be given to the ANT approach since it solves the technology/society dualisms unresolved by the previous proposals and is a flexible epistemological possibility that can reach the ambiguity of contemporary life and the remarkable transformations brought by progress that have changed drastically childhood and children's contemporary lives.

Teacher Education

Chapter 666: The Technological Pedagogical Content Knowledge of EFL Teachers (EFL TPACK)

Mehrak Rahimi, Shahid Rajaee Teacher Training University, Iran and Shakiba Pourshahbaz, Shahid Rajaee Teacher Training University, Iran

In the 21st century, the force of technological empowerment and ICT integration in schools has multiplied the stressful nature of the profession for teachers. To make the whole process of education more successful and to protect the well-being of teachers, empowering teachers to handle their job appropriately is a very crucial issue. TPACK (Technological Pedagogical Content Knowledge) is the knowledge of most value in today's world and understanding this complex knowledge is the very first step in the path of successful ICT integration into the process of teaching. With that being said, this chapter aims at investigating the concept of TPACK in terms of education in general and language teaching in particular.

Ubiquitous and Pervasive Computing

Chapter 675: Home UbiHealth

John Sarivogioukas, "G. Gennimatas" Athens General Hospital, Greece; Aristides Vagelatos, CTI&P, Greece; Konstantinos Parsopoulos, University of Ioannina, Greece; and Isaac Lagaris, University of Ioannina, Greece

At the third computing era, users interact with many computing devices, surrounding or implanted in them, in a natural way, anytime and anywhere implementing the concept of ubiquitous computing. Moreover, the ubiquitous computing implementations provide the advantageous characteristics of awareness and personalization which are precious in healthcare applications: the operating computing devices in the patient's environment can be aware about the evolving situations and actively participate in the provision of the medical treatment. The adoption of the home healthcare model in a ubiquitous computing environment provides the prerequisites for the development of the Home UbiHealth model. Extending the formal provision of medical services at home provides the capability to cover the medical needs of all the population categories.

Urban and Regional Development

Chapter 683: Reconstructive Architectural and Urban Digital Modelling

Roberta Spallone, Politecnico di Torino, Italy

The digital reconstruction of architectural and urban complexes which were demolished, transformed or have been only theoretically conceived, remaining 'on paper' is now a tool of considerable heuristic value, allowing to preserve, interpret and create new images of cultural heritages that no longer exist in their original shape or never reached a material construction. The examination of several international case studies, and also some experiences personally conducted highlights the different strategies used for the preservation of the memory of such heritage.

Virtual Learning Environments

Chapter 688: Open Source Software Virtual Learning Environment (OSS-VLEs) in Library Science Schools

Rosy Jan, University of Kashmir, India

A Virtual Learning Environment (VLE) is a software system designed to facilitate teachers in the management of educational courses. The system can often track the learners' progress, which can be monitored by both teachers and learners. While often thought of as primarily tools for distance education, they are most often used to supplement the face-to-face classroom as well as blended learning. Keeping in view the benefits, the work has been initiated to review concept, features and issues of virtual learning environments. Some of the most used OSS VLEs are discussed. Further it determines the suitability of a VLE for higher education. The chapter also explores and identifies the recent contributions to the concept by analyzing ongoing virtual learning initiatives and projects by different organizations and information centres to stimulate future research and development trend in the field."

Web Technologies

Chapter 702: Usability of CAPTCHA in Online Communities and Its Link to User Satisfaction

Samar Swaid, Philander Smith College, USA

Completely Automated Public Turing Test to Tell Computers and Humans Apart (CAPTCHA) is a security mechanism that is used by online communities to block spam and hacking. Today, there are a large number of sophisticated CAPTCHAs that are robust, however, most of them are unusable. This chapter describes a study to examine types and characteristics of Text CAPTCHAs used by top 50 online communities. Furthermore, the study is the first of its type to develop a scale to measure usability of text CAPTCHA and examines relationships between dimensions of CAPTCHA and perception of usability and satisfaction with registration process in online communities. Factor analysis and equation modeling study suggests that text-based CAPTCHA can be measured on four reflective dimensions of: (i) content; (ii) visual layout; (iii) distortion and (iv) service; in which correlate significantly to user's satisfaction with online community.

Chapter 704: Web Site Mobilization Techniques

John Sandvig, Western Washington University, USA

Mobile-friendly web sites are designed to render well on all digital devices, including smartphones, desktop computers, laptop computers, and tablets. Creating a user-friendly experience on mobile devices requires specific web design techniques. These techniques are designed to accommodate the small screens and other physical limitations of mobile devices. This article describes the three primary techniques for creating mobile-friendly web sites: responsive, separate URL, and server adaptive. It explains how each technique is implemented, the advantages and disadvantages of each, and their relative popularity. It also describes an emerging mobile technique called Accelerated Mobile Pages.

Jo Ann Oravec, University of Wisconsin at Whitewater, USA

Jo Ann Oravec is a Professor in the College of Business and Economics at the University of Wisconsin at Whitewater in the Department of Information Technology and Supply Chain Management. She received her MBA, MS, MA, and PhD degrees at the University of Wisconsin at Madison. She taught computer information systems and public policy at Baruch College of the City University of New York and also taught in the School of Business and the Computer Sciences Department at UW-Madison as well as at Ball State University. In the 1990s, she chaired the Privacy Council of the State of Wisconsin, the nation's first state-level council dealing with information technology and privacy issues. She has written books (including "Virtual Individuals, Virtual Groups: Human Dimensions of Groupware and Computer Networking," Cambridge University Press) and dozens of articles on technological design, privacy, computing technology, management, disability studies, and public policy. She has worked for public television and developed software along with her academic ventures. She has held visiting fellow positions at both Cambridge and Oxford and has been a featured speaker and given presentations in Japan and Australia.



Dominic Mentor, Columbia University, USA

Dominic Mentor (Ed.D.) is an Adjunct Asst. Prof. at Teachers College (TC), Columbia University. He initiated and co-designed the USA's first mLearning graduate class and a social media fellowship for the NYC Mayor's Office of Adult Education. He received the Optimas Gold

Vision 2014 award from Workforce Magazine. He was keynote speaker at the 2014 Educational Technology summit in South Africa and 2012 Technology in Education conference at William Patterson University. Presentations include African Center for Education at TC, Borough of

Manhattan Community College, Adelphi University, Baruch College and TEDx.

Recent publications: Editor and contributing author of the Handbook of Research on Mobile Learning in Contemporary Classrooms, as well as chapters in Tablets in K-12 Education: Integrated Experiences and Implications, and Encyclopedia of Mobile Phone Behavior. Other publications include articles in Educause 1. Teaching America's First Course on Mobile Phone Learning and 2. Supporting Students' Connectedness via Texting. Article in The Center for African Education's Forum titled Old lessons, New Media Out of Africa. Presentations include UNESCO 2014 mLearning week conference (Paris, France), Harvard's 21st Century Academic Forum 2014 Conference (Boston, USA), and eLearning in the Workplace 2014 conference.



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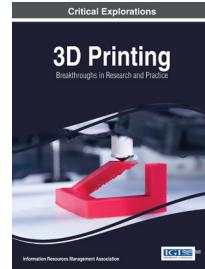
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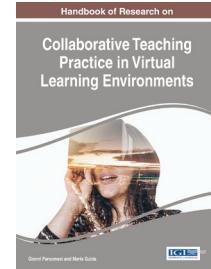
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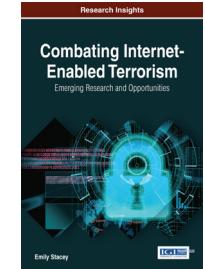
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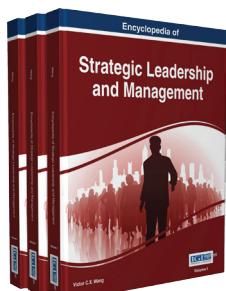
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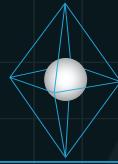


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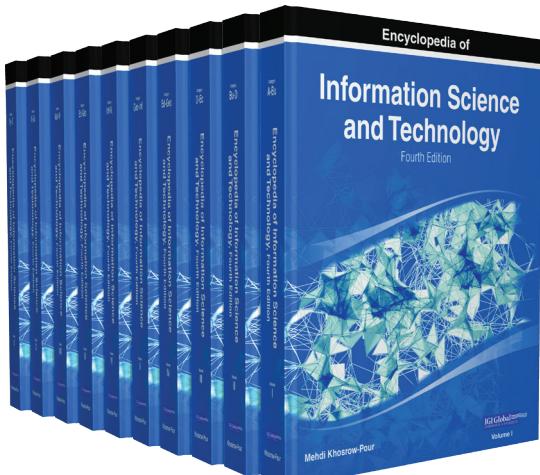
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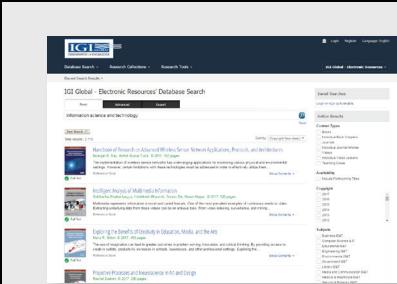
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