
Ambient Intelligence and Internet of Things: Convergent Technologies

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DESCRIPTION

Ambient Intelligence and Internet of Things: Convergent Technologies provides a comprehensive knowledge of Aml and the IoT along with practical applications. The book focuses on the fundamental structure of innovative cutting-edge Aml and IoT technologies.

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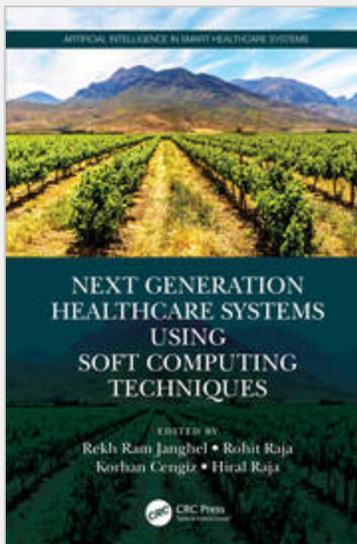
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Next Generation Healthcare Systems Using Soft Computing Techniques

Edited By Rekh Ram Janghel, Rohit Raja, Korhan Cengiz, Hiral Raja

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Book Description

This book presents soft computing techniques and applications used in healthcare systems, along with the latest advancements. Written as a guide for assessing the roles that these techniques play, the book also highlights implementation strategies, lists problem-solving solutions, and paves the way for future research endeavors in smart and next-generation healthcare systems.

This book provides applications of soft computing techniques related to healthcare systems and can be used as a reference guide for assessing the roles that various techniques, such as machine learning, fuzzy logic, and statical mathematics, play in the advancements of smart healthcare systems. The book presents the basics as well as the advanced concepts to help beginners, as well as industry professionals, get up to speed on the latest developments in healthcare systems. The book examines descriptive, predictive, and social network techniques and discusses analytical tools and the important role they play in finding solutions to problems in healthcare systems. A framework of robust and novel healthcare techniques is highlighted, as well as implementation strategies and a setup for future research endeavors.

Healthcare Systems Using Soft Computing Techniques is a valuable resource for researchers and postgraduate students in healthcare systems engineering, computer science, information technology, and applied mathematics. The book introduces beginners to—and at the same time brings industry professionals up to speed with—the important role soft computing techniques play in smart healthcare systems.

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Biography

Rekh Ram Janghel received a PhD in information technology (2013) from ABV-IIITM Gwalior. His main research interest includes face recognition and identification, digital image processing, signal processing, and networking. Presently, he is working as assistant professor in NIT Raipur. He has academic and research experience in various areas of CSE and IT. He has filed and published successfully 11 patents. He has received many invitations to be a guest at IEEE conferences. Dr.

Janghel has published 50 research papers in various international/national journals (including IEEE, Springer etc.) and proceedings of the reputed international/national conferences (including Springer and IEEE). He has been nominated for the board of editors/reviewers of many peer-reviewed and refereed journals.

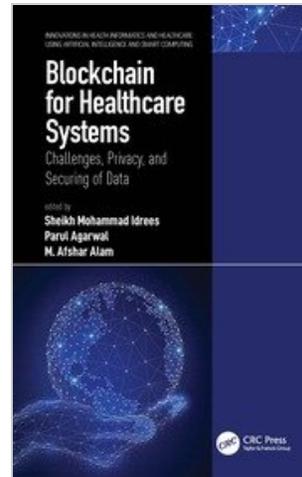
Rohit Raja received a PhD in computer science and engineering from CVRAMAN University in 2016. His main research interests include face recognition and identification, digital image processing, signal processing, and networking. Presently he is working as associate professor in the IT Department, Guru Ghasidas Vishwavidyalaya, Bilaspur (CG), India. He has authored several journal and conference papers. He has good academics & research experience in various areas of CSE and IT. He has filed and published successfully 12 patents. He has received an invitation to be a guest at the IEEE Conference. He has published 77 research papers in various international/national journals (including IEEE and Springer) and proceedings of the reputed international/national conferences (including Springer and IEEE). He has been nominated for the board of editors/ reviewers of many peer-reviewed and refereed journals (including IEEE, Springer).

Korhan Cengiz, PhD, SMIEEE was born in Edirne, Turkey, in 1986. He received BS degrees in electronics and communication engineering from Kocaeli University, Turkey, and business administration from Anadolu University, Turkey, in 2008 and 2009, respectively. He earned his MS degree in electronics and communication engineering from Namik Kemal University, Turkey, in 2011, and a PhD degree in electronics engineering from Kadir Has University, Turkey, in 2016. Since 2018, he has been an assistant professor with the Electrical-Electronics Engineering Department, Trakya University, Turkey. He is the author of over 40 articles, including in IEEE Internet of Things Journal, IEEE Access, Expert Systems with Applications and Knowledge Based Systems, three book chapters, two international patents, and one book in Turkish. His research interests include wireless sensor networks, wireless communications, statistical signal processing, indoor positioning systems, power electronics, and 5G. He is associate editor of Interdisciplinary Sciences: Computational Life Sciences, Springer; handling editor of Microprocessors and Microsystems, Elsevier; associate editor of IET Electronics Letters, IET Networks; and editor of AEÜ – International Journal of Electronics and Communications, Elsevier. He has guest editorial positions in IEEE Internet of Things Magazine and CMC-Computers, Materials & Continua. He serves in several reviewer positions for IEEE Internet of Things Journal, IEEE Sensors Journal, and IEEE Access. He serves in several book editorial positions for Springer, Elsevier, Wiley, and

CRC. He presented ten plus keynote talks in reputed IEEE and Springer Conferences about WSNs, IoT, and 5G. He is a senior member, IEEE, since August 2020. Dr. Cengiz's awards and honors include the Tubitak Priority Areas Ph.D. Scholarship, the Kadir Has University PhD Student Scholarship, best presentation award in ICAT 2016 Conference, and best paper award in ICAT 2018 Conference.

Hiral Raja is working as associate professor in the Mathematics Department at Dr. C.V. Raman University Bilaspur. She received her PhD in mathematics in 2017 from C.V. Raman University India. Her main research includes image processing, embedded system, artificial intelligence, and sensor signaling. She was successfully granted two national and two international patents. She has published approximately ten research papers in national and international journals, including Scopus, IEEE, and Springer.

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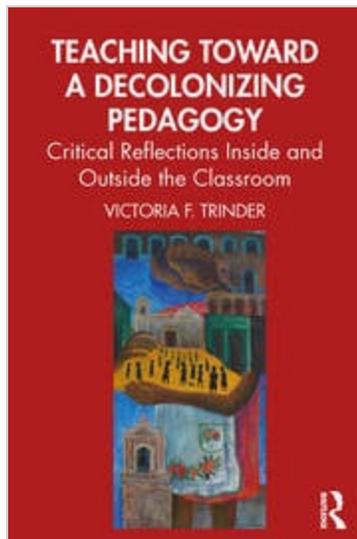
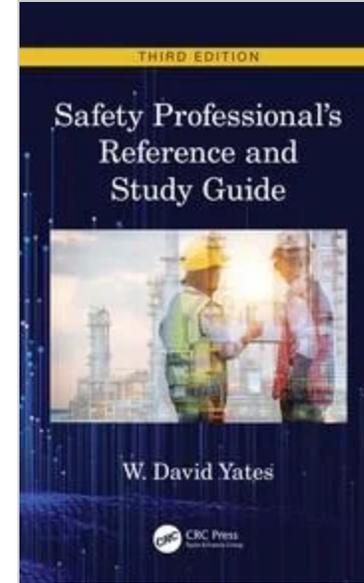
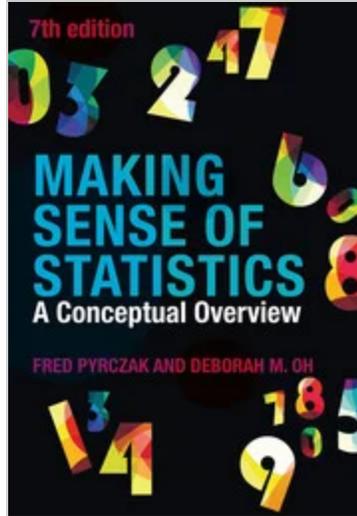
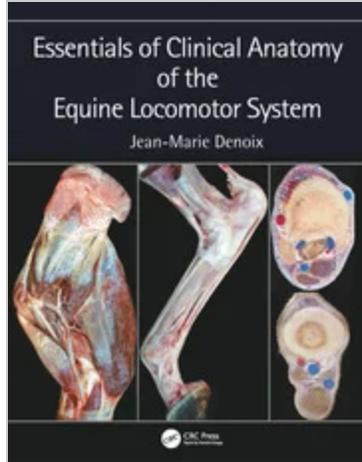
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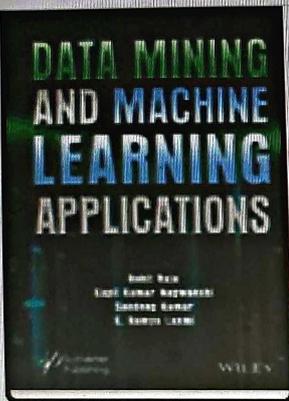
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Preface

This volume contains the papers that were presented at the 5th International Conference on Smart Computing and Informatics (SCI-2021) organized by the Department of Computer Science and Engineering, Vasavi College of Engineering (Autonomous), Ibrahimbagh, Hyderabad, Telangana, during September 17–18, 2021. It provided a great platform for researchers from across the world to report, deliberate, and review the latest progress in the cutting-edge research pertaining to smart computing and its applications to various engineering fields.

The response to SCI-2021 was overwhelming with a good number of submissions from different areas relating to artificial intelligence, machine learning, cognitive computing, computational intelligence, and its applications in main tracks. After a rigorous peer review with the help of technical program committee members and external reviewers, only quality papers were accepted for publication in this volume.

Several special sessions were offered by eminent professors in cutting-edge technologies such as data analysis of expert system-based models using machine learning, Blockchain 4.0, artificial intelligence and industrial Internet of Things paradigm and interdisciplinary data's issues opportunities and challenges with big data analysis. Eminent researchers and academicians delivered talks addressing the participants in their respective field of proficiency. Our thanks are due to Prof. Dr. Carlos M. Travieso-González, Professor and Head of Signals and Communications Department, Institute for Technological Development and Innovation in Communications (IDeTIC), University of Las Palmas de Gran Canaria (ULPGC), Spain, Shri. Balpreet Singh, Director of Engineering, Intel IOTG, Hyderabad, and Mr. Rahul Ghali, Senior Manager, Accenture, India, for delivering keynote addresses for the benefit of the participants. We would like to express our appreciation to the members of the technical program committee for their support and cooperation in this publication. We are also thankful to team from Springer for providing a meticulous service for the timely production of this volume.

Our heartfelt thanks to Shri. M. Krishna Murthy, Secretary, VAE, Sri. P. Balaji, CEO, VCE, and Dr. S. V. Ramana, Principal, VCE, for extending support to conduct this conference in Vasavi College of Engineering. Profound thanks to Prof. Lakhmi

C. Jain, Australia, for his continuous guidance and support from the beginning of the conference. Without his support, we could never have executed such a mega event.

Special thanks to all guests who have honored us in their presence in the inaugural day of the conference. Our thanks to all special session chairs track managers and reviewers for their excellent support. Our special thanks to all the authors who submitted papers and all the attendees for their contributions and fruitful discussions that made this conference a great success.

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December 2021

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Chapter 57

Fingerprint Liveliness Detection to Mitigate Spoofing Attacks Using Generative Networks in Biometric System



Akanksha Gupta, Rajesh Mahule, Raj Kumar Patra, Krishan Gopal Saraswat, and Mozammil Akhtar

Abstract Today fingerprint detection system is being used widely, from a corporate office to military camps. They are secure, have speed and accurate, but they are vulnerable to spoof attacks. And the primary aim of the fingerprint reader is to provide definitive and exact user authentication but also to be secure and ensure user confidence. The most prominent vulnerability in fingerprint spoof detection system was poor generalization of spoof classes that means whenever an unknown spoof the material was given to the detection system the error rate increases up to 3 folds. To improve the accuracy and performance of the fingerprint detection systems when fabricated to an unknown number of spoof materials thus decreasing the cross-performance error rate. Hence improving the poor generalizing problem of a fingerprint spoof detector using generative and other convolution networks. We are using one-class classification and minutiae extraction approaches using DCGANs and MobileNets, respectively, and using these networks gives a spoof score to given fingerprint and found out that our results had an accuracy of 5–10% more than the previous binary spoof classifiers.

57.1 Introduction

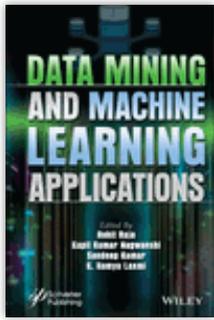
Today, fingerprint biometrics are taking place of traditional IDs, used in forensics, border crossing security, mobile authentication, payment transactions, ATM machines, laptops and places where user authentication is required [1]. Bolts can be stolen, safes can be broken, and passwords can also be guessed sooner or later. So how do we save the things that we value? Here then, we use biometrics say fingerprint scan,

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About this book

DATA MINING AND MACHINE LEARNING APPLICATIONS

The book elaborates in detail on the current needs of data mining and machine learning and promotes mutual understanding among research in different disciplines, thus facilitating research development and collaboration.

Data, the latest currency of today's world, is the new gold. In this new form of gold, the most beautiful jewels are data analytics and machine learning. Data mining and machine learning are considered interdisciplinary fields. Data mining is a subset of data analytics and machine learning involves the use of algorithms that automatically improve through experience based on data.

Massive datasets can be classified and clustered to obtain accurate results. The most common technologies used include classification and clustering methods. Accuracy and error rates are calculated for regression and classification and clustering to find actual results through algorithms like support vector machines and neural networks with forward and backward propagation. Applications include fraud detection, image processing, medical diagnosis, weather prediction, e-commerce and so forth.

The book features:

- A review of the state-of-the-art in data mining and machine learning,
- A review and description of the learning methods in human-computer interaction,
- Implementation strategies and future research directions used to meet the design and application requirements of several modern and real-time applications for a long time,
- The scope and implementation of a majority of data mining and machine learning strategies.
- A discussion of real-time problems.

Audience

Industry and academic researchers, scientists, and engineers in information technology, data science and machine and deep learning, as well as artificial intelligence more broadly.

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