Learning and Analytics in Intelligent Systems 17

Pradeep Kumar Mallick
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Cognitive Computing in Human Cognition

Perspectives and Applications

Springer

Learning and Analytics in Intelligent Systems

Volume 17

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ISSN 2662-3447 ISSN 2662-3455 (electronic)
Learning and Analytics in Intelligent Systems
ISBN 978-3-030-48117-9 ISBN 978-3-030-48118-6 (eBook)
https://doi.org/10.1007/978-3-030-48118-6

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

The aim of the book is to bring together leading academic scientists, researchers, and research scholars to exchange and share their experiences and research results on all aspects of cognitive computing in human cognition. It also provides a premier interdisciplinary platform for researchers, practitioners, and educators to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the fields of IoT and analytics for agriculture. The book is organized into ten chapters,

Chapter "Improved Steganography Using Odd Even Substitution": The proposed image steganography technique implements an LSB technique with an algorithm to hide message bits in the DCT coefficients.

Chapter "A Tags Mining Approach for Automatic Image Annotation Using Neighbor Images Tree": This chapter developed a new model for addressing these issues using a tree mechanism of photos related to the target image.

Chapter "A Survey: Implemented Architectures of 3D Convolutional Neural Networks": In this paper, we survey on different implementations of 3D convolutional neural networks and their respective accuracies for different datasets. We then compare all the architectures to find which one is most suitable to perform flexibly on CBCT-scanned images.

Chapter "An Approach for Detection of Dust on Solar Panels Using CNN from RGB Dust Image to Predict Power Loss": This chapter focuses on CNN-based approach to detect dust on solar panel and predicted the power loss due to dust accumulation. We have taken RGB image of solar panel from our experimental setup and predicted power loss due to dust accumulation on solar panel.

Chapter "A Novel Method of Data Partitioning Using Genetic Algorithm Work Load Driven Approach Utilizing Machine Learning": The proposed chapter utilizes natural computing optimization-inspired genetic algorithm (GA) for the improvisation of the partitioned data structure. The optimized set is cross-validated utilizing artificial neural network.

Chapter "Virtual Dermoscopy Using Deep Learning Approach": This chapter presents an automated dermatological diagnostic system using a deep learning approach. Dermatology is the branch of medicine which deals with the

identification and treatment of skin diseases. The presented system is a machine interference in contradiction to the traditional medical personnel-based belief of dermatological diagnosis.

Chapter "Evaluating Robustness for Intensity Based Image Registration Measures Using Mutual Information and Normalized Mutual Information": This chapter uses information measures such as mutual information (MI) and normalized mutual information (NMI) to obtain the aligned image and then evaluated their robustness.

Chapter "A New Contrast Based Degraded Document Image Binarization": This chapter proposes the binarization technique which uses the contrast feature to compute the threshold value with minimum parameter tuning. It computes the local contrast image using maximum and minimum pixel values in the neighborhood. The high contrast text pixels in the image are detected using global binarization.

Chapter "Graph Based Approach for Image Data Retrieval in Medical Application": This chapter describes new technique such as max flow graph-based approach. Max flow-based techniques have more accurate result than PCA and Hessian method.

Chapter "Brain Computer Interface: A New Pathway to Human Brain": This chapter focuses on past 15 years, and this assistive technology has attracted potentials numbers of users as well as researchers from multidiscipline.

We are sincerely thankful to Almighty to supporting and standing at all times with us, starting from the call for chapters till the finalization of chapters, all the editors have given their contributions amicably, which it is a positive sign of significant team works. The editors are sincerely thankful to all the members of Springer. We are equally thankful to reviewers for their timely help and authors who have shared their chapters.

Bhubaneswar, India — Pradeep Kumar Mallick
Bhubaneswar, India — Prasant Kumar Pattnaik
Bhubaneswar, India — Amiya Ranjan Panda
Arad, Romania — Valentina Emilia Balas

About This Book

This edited book designed the cognitive computing in human cognition to analyze to improve the efficiency of decision making by cognitive intelligent. The book also intended to attract the audience who work in brain computing, deep learning, transportation, and solar cell energy. Due to this in recent era, smart methods with human touch called as human cognition are adopted by many researchers in the field of information technology with the cognitive computing.

Key Features

1. Addresses the complete functional framework workflow in advances of cognitive computing.
2. Addresses the different data mining techniques was applied.
3. Exploring data studies related to data-intensive technologies in solar panel energy, machine learning, and big data.

Contents

About the Editors

Dr. Pradeep Kumar Mallick is currently working as a senior associate professor in the School of Computer Engineering, Kalinga Institute of Industrial Technology (KIIT) Deemed to be University, Odisha, India. He has also served as a professor and head of the Department of Computer Science and Engineering, Vignana Bharathi Institute of Technology, Hyderabad. He has completed his postdoctoral fellow (PDF) in Kongju National University, South Korea, Ph.D. from Siksha 'O' Anusandhan University, M. Tech. (CSE) from Biju Patnaik University of Technology (BPUT), and MCA from Fakir Mohan University Balasore, India. Besides academics, he is also involved in various administrative activities, Member of Board of Studies, Member of Doctoral Research Evaluation Committee, Admission Committee, etc. His area of research includes algorithm design and analysis, and data mining, image processing, soft computing, and machine learning. Now he is the editorial member of Korean Convergence Society for SMB. He has published nine books and more than 70 research papers in national and international journals and conference proceedings in his credit.

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Dr. Amiya Ranjan Panda has seven years of research experience in DRDO and one year of teaching experience. He received the B.Tech. degree in information technology from Biju Patnaik University of Technology, Rourkela, India, in 2009, and the M.Tech. degree in computer science and engineering from the Kalinga

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Improved Steganography Using Odd Even Substitution

Ramandeep Kaur Brar and Ankit Sharma

Abstract Image steganography is one of the emerging techniques used for hiding content in digital images. This makes the content more secure and free from information attackers. The proposed image steganography technique implements an LSB technique with an algorithm to hide message bits in the DCT coefficients. The technique has chosen a mid-band frequency area for the bit's substitution in an odd and even bit selection. The results are better than traditional LSB. The parameters used are PSNR and MSE to understand the blur or noise added to the cover image while adding the secret message.

Keywords QR code · Steganography · Image steganography · Least significant bit (LSB) technique · Discrete cosine transform (DCT) · Peak signal to noise ratio (PSNR) · Mean square error (MSE)

1 Introduction

1.1 QR Code

QR code located for Quick Response Code that is a kind of matrix barcode otherwise we can say that two-dimensional barcode which is intended for the first manufacturing in Japan. Mainly, a barcode is a machine-readable photosensitive tag that comprises data around the piece to which it is involved [1]. A QR code consists of black modules such as square dots arranged in a square on a white backdrop set, which can be deciphered by an imaging device like a camera and the process of with error correction rate when the image does not go well, explained. In both horizontal and

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P. K. Mallick et al. (eds.), *Cognitive Computing in Human Cognition*,
Learning and Analytics in Intelligent Systems 17,
https://doi.org/10.1007/978-3-030-48118-6_1