

Pardeep Kumar
Amit Kumar Singh *Editors*

Machine Learning for Intelligent Multimedia Analytics

Techniques and Applications

 Springer

Editors

Pardeep Kumar
Department of Computer Science and
Engineering and Information Technology
Jaypee University of Information
Technology
Solan, Himachal Pradesh, India

Amit Kumar Singh
Department of Computer Science
and Engineering
National Institute of Technology
Patna, Bihar, India

ISSN 2197-6503

Studies in Big Data

ISBN 978-981-15-9491-5

<https://doi.org/10.1007/978-981-15-9492-2>

ISSN 2197-6511 (electronic)

ISBN 978-981-15-9492-2 (eBook)

© Springer Nature Singapore Pte Ltd. 2021

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd. The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Contents

Secure Multimodal Access with 2D and 3D Ears	1
Iyyakutti Iyappan Ganapathi, Surya Prakash, and Syed Sadaf Ali	
Efficient and Low Overhead Detection of Brain Diseases Using Deep Learning-Based Sparse MRI Image Classification	21
Avrajit Ghosh, Arnab Raha, and Amitava Mukherjee	
Continual Deep Learning Framework for Medical Media Screening and Archival	45
Pallavi Saha and Apurba Das	
KannadaRes-NeXt: A Deep Residual Network for Kannada Numeral Recognition	63
Aradhya Saini, Sandeep Daniel, Satyam Saini, and Ankush Mittal	
Secure Image Transmission in Wireless Network Using Conventional Neural Network and DOST	91
Manoj Diwakar and Pardeep Kumar	
Robust General Twin Support Vector Machine with Pinball Loss Function	103
M. A. Ganaie and M. Tanveer	
Noise Resilient Thresholding Based on Fuzzy Logic and Non-linear Filtering	127
Shreya Goyal, Gaurav Bhatnagar, and Chiranjoy Chattopadhyay	
Deep Learning Methods for Audio Events Detection	147
Giuseppe Ciaburro	
A Framework for Multi-lingual Scene Text Detection Using K-means++ and Memetic Algorithms	167
Neelotpal Chakraborty, Averi Ray, Ayatullah Faruk Mollah, Subhadip Basu, and Ram Sarkar	

Recent Advancements in Medical Imaging: A Machine Learning Approach	189
Nitin Dang, Shailendra Tiwari, Manju Khurana, and K. V. Arya	
Solving Image Processing Critical Problems Using Machine Learning	213
Ajay Sharma, Ankit Gupta, and Varun Jaiswal	
Spoken Language Identification of Indian Languages Using MFCC Features	249
Mainak Biswas, Saif Rahaman, Satwik Kundu, Pawan Kumar Singh, and Ram Sarkar	
Performance Evaluation of One-Class Classifiers (OCC) for Damage Detection in Structural Health Monitoring	273
Akshit Agarwal, Varun Gupta, and Dhiraj	
Brain Tumor Classification in MRI Images Using Transfer Learning	307
Aaditya Pundir and Er. Rajeev Kumar	
Semantic-Based Vectorization Technique for Hindi Language	321
Shikha Mundra, Ankit Mundra, Josh Agarwal, and Pankaj Vyas	

About the Editors

Dr. Pardeep Kumar is currently working as an Associate Professor in the Department of Computer Science & Engineering and Information Technology at Jaypee University of Information Technology (JUIT), Wakanaghat, Solan, Himachal Pradesh, India. He has been associated with his current employer since 2008. Prior to joining Jaypee Group, he was associated with Mody University of Technology & Science (Formerly known as Mody Institute of Technology & Science) Laxmangarh, Sikar, Rajasthan. He has completed PhD (Computer Science and Engineering) from Uttarakhand Technical University, Dehradun, India, M.Tech (Computer Science & Engineering) from Guru Jambheshwar University of Science & Technology, Hisar, Haryana, India and B.Tech (Information Technology) from Kurukshetra University, Kurukshetra, Haryana, India. He has served as Executive General Chair of 2016 Fourth International Conference on Parallel, Distributed and Grid Computing (PDGC), Guest Editor of Special Issue on “Robust and Secure Data Hiding Techniques for Telemedicine Applications”, *Multimedia Tools and Applications: An International Journal*, Springer (SCI Indexed Journal, IF = 1.346), Lead Guest Editor of Special Issue on “Recent Developments in Parallel, Distributed and Grid Computing for Big Data”, published in the *International Journal of Grid and Utility Computing*, Inderscience (Scopus Indexed), and Guest Editor of Special Issue on “Advanced Techniques in Multimedia Watermarking”, published in the *International Journal of Information and Computer Security*, Inderscience (Scopus Indexed). Dr. Kumar has been appointed as an Associate Editor of *IEEE Access* (SCI Indexed, IF = 3.5) Journal. His area of interest includes machine learning, medical image mining, image processing, health care informatics, etc.

Dr. Amit Kumar Singh is currently an Assistant Professor with the Computer Science and Engineering Department, National Institute of Technology Patna, Bihar, India. He received his PhD from National Institute of Technology Kurukshetra, Haryana, India in 2015. He has authored over 100 peer-reviewed journal, conference publications, and book chapters. He has authored three books and edited five books with internationally recognized publishers such Springer and

Elsevier. Dr. Singh have been recognized as “WORLD RANKING OF TOP 2% SCIENTISTS” in the area of “Biomedical Research” (for Year 2019), according to the survey given by Stanford University, USA. He is the associate editor of *IEEE Access* (Since 2016), *IEEE Future Directions* (Since 2020), *IET Image Processing* (Since 2020), *Telecommunication Systems*, Springer (Since 2020), *Journal of Intelligent Systems*, De Gruyter (Since 2020), and former member of the editorial board of *Multimedia Tools and Applications*, Springer (2015–2019). He has edited various international journal special issues as a lead guest editor such as *ACM Transactions on Multimedia Computing, Communications, and Applications*, *ACM Transactions on Internet Technology*, *IEEE Consumer Electronics Magazine*, *IEEE Access*, *Multimedia Tools and Applications*, Springer, *International Journal of Information Management*, Elsevier, *Journal of Ambient Intelligence and Humanized Computing*, Springer. He has obtained the memberships from several international academic organizations such as ACM and IEEE. His research interests include multimedia data hiding, image processing, biometrics, & Cryptography.