Chawki Djeddi · Imran Siddiqi · Akhtar Jamil · Alaa Ali Hameed · İsmail Kucuk (Eds.)

Communications in Computer and Information Science

1543

Pattern Recognition and Artificial Intelligence

5th Mediterranean Conference, MedPRAI 2021 Istanbul, Turkey, December 17–18, 2021 Proceedings



Communications in Computer and Information Science

1543

Editorial Board Members

Joaquim Filipe

Polytechnic Institute of Setúbal, Setúbal, Portugal

Ashish Ghosh

Indian Statistical Institute, Kolkata, India

Raquel Oliveira Prates

Federal University of Minas Gerais (UFMG), Belo Horizonte, Brazil

Lizhu Zhou

Tsinghua University, Beijing, China

More information about this series at https://link.springer.com/bookseries/7899

Chawki Djeddi · Imran Siddiqi · Akhtar Jamil · Alaa Ali Hameed · İsmail Kucuk (Eds.)

Pattern Recognition and Artificial Intelligence

5th Mediterranean Conference, MedPRAI 2021 Istanbul, Turkey, December 17–18, 2021 Proceedings



Editors
Chawki Djeddi
Larbi Tebessi University
Tebessa, Algeria

Akhtar Jamil FAST National University Islamabad, Pakistan

İsmail Kucuk (1)
Istanbul Sabahattin Zaim University
Istanbul, Turkey

Imran Siddiqi
Bahria University
Islamabad, Pakistan

Alaa Ali Hameed

Istanbul Sabahattin Zaim University
Istanbul, Turkey

ISSN 1865-0929 ISSN 1865-0937 (electronic) Communications in Computer and Information Science ISBN 978-3-031-04111-2 ISBN 978-3-031-04112-9 (eBook) https://doi.org/10.1007/978-3-031-04112-9

© Springer Nature Switzerland AG 2022

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 Switzerland AG The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

It gives us immense pleasure to introduce this volume of proceedings for the 5th Mediterranean Conference on Pattern Recognition and Artificial Intelligence (MedPRAI 2021). The conference was organized by the Department of Computer Engineering, Istanbul Sabahattin Zaim University, Istanbul, Turkey, during December 17–18, 2021. The conference aimed at providing researchers and practitioners from academia and industry with a forum to share the latest developments in pattern recognition and artificial intelligence.

We are pleased to announce that the response to the Call for Papers for MedPRAI 2021 was very encouraging. A total of 72 papers covering different themes in pattern recognition and artificial intelligence were submitted to the conference. These papers were reviewed by renowned researchers in the respective fields from all over the world. After a thorough and competitive paper review and selection process, 28 high-quality papers were accepted for presentation at the conference yielding an acceptance rate of 39%. This volume comprises the 28 papers which eventually qualified for presentation at the conference.

We would like to take this opportunity to thank the reviewers for their time and efforts in reviewing the papers and providing constructive feedback to the authors. We are also thankful to the keynote speakers and all the authors who submitted papers to the conference. We would also like to extend our cordial appreciation to all members of the organizing committees for their untiring efforts in making this event a success.

We thank all the attendees for participation in the conference and hope that the event provided valuable knowledge sharing and networking opportunities.

December 2021

Chawki Djeddi Imran Siddiqi Akhtar Jamil Alaa Ali Hameed İsmail Kuçuk

Organization

General Chairs

Akhtar Jamil FAST National University, Pakistan

Ismail Kucuk Istanbul Sabahattin Zaim University, Turkey

Program Committee Chairs

Alaa Ali Hameed Istanbul Sabahattin Zaim University, Turkey

Chawki Djeddi Larbi Tebessi University, Algeria Imran Siddiqi Bahria University, Pakistan

Steering Committee

Abdel Ennaji University of Rouen, France

Ameur Bensefia Higher Colleges of Technology, Abu Dhabi, UAE

Chang Choi Chosun University, South Korea

Haikal El Abed Deutsche Gesellschaft für Internationale

Zusammenarbeit (GIZ) GmbH, Jordan

Haoxiang Wang Cornell University, USA

Javad Sadri Concordia University, Canada

Organizing Committee

Amani Yahiaoui Istanbul Sabahattin Zaim University, Turkey

Jawad Rasheed Istanbul Aydin University, Turkey

Moises Diaz Universidad de Las Palmas de Gran Canaria,

Spain

Muhammad Davud Istanbul Sabahattin Zaim University, Turkey Zehra Ilmi Cogalmis Istanbul Sabahattin Zaim University, Turkey

Program Committee

Abbas Cheddad Blekinge Institute of Technology, Sweden

Abdel Ennaji University of Rouen, France
Abdelhakim Hannousse Guelma University, Algeria
Abdeljalil Gattal Larbi Tebessi University, Algeria
Ahmad Bouridane Northumbria University, UK
Akhtar Jamil FAST National University, Pakistan

Aladine Chetouani Polytech Orléans, France

Ameur Bensefia Higher Colleges of Technology, Abu Dhabi, UAE

Amutha Benziker Anna University, Chennai, India Ana Mendonca University of Porto, Portugal **Bart Lamiroy** University of Lorraine, France Boubakeur Boufama University of Windsor, Canada Cemal Okan Sakar Bahçeşehir University, Turkey Chawki Djeddi Larbi Tebessi University, Algeria Chavan Halder West Bengal State University, India

NUST. Pakistan Hammad Afzal Hassiba Nemmour USTHB, Algeria

Hong Wei University of Reading, UK Imran Siddiqi Bahria University, Pakistan Jean-Marc Ogier University of La Rochelle, France

Instituto Politécnico Nacional, Mexico Juan Humberto Sossa Khurram Khurshid Institute of Space Technology, Pakistan Marco Anisetti Università degli Studi di Milano, Italy

Marta Cimitile Unitelma Sapienza, Italy

Universitat Autònoma de Barcelona, Spain Mohamed Ali Souibgui

Mohamed, Chaouki Babahenini University of Biskra, Algeria

Mohamed El Bachir Menai King Saud University, Saudi Arabia

Moises Diaz Universidad de Las Palmas de Gran Canaria.

Spain

Momina Moetesum Bahria University, Pakistan Muhammad Asfandeyar Bahria University, Pakistan

Muhammad Shehzad Hanif King Abdulaziz University, Saudi Arabia Muhammed Cinsdikici Manisa Celal Bayar University, Turkey

Murat Gezer Istanbul University, Turkey

Mustafa Abuzaraida Universiti Utara Malaysia, Malaysia Nicolas Sidère University of La Rochelle, France Nicole Vincent Paris Descartes University, France Okba Kazar University of Biskra, Algeria Paulo Batista University of Évora, Portugal Rachid Hedjam Sultan Qaboos University, Oman MEA Engineering College, India Renjith V. Ravi

ESIEE Paris, France Rostom Kachouri

Said Ghoul Philadelphia University, Jordan Serge Miguet Université Lumière Lyon 2, France Sergey Ablameyko Belarusian State University, Belarus Sobhan Sarkar

University of Edinburgh, UK

Sourour Ammar Digital Research Center of Sfax, Tunisia

Kocaeli University, Turkey Süleyman Eken

Tayeb Benzanati Vincent Christlein Virendra Kumar Yassine Benayed Digital Research Center of Sfax, Tunisia University of Erlangen-Nuremberg, Germany All India Institute of Medical Sciences, India ISIMS Sfax, Tunisia

Contents

Computer Vision and Image Processing	
Human Action Recognition Using Attention Mechanism and Gaze Information	3
Reyhaneh MohebAli, Rahil Mahdian Toroghi, and Hassan Zareian	
Face Recognition Under Partial Occlusion: A Detection and Exclusion of Occluded Face Regions Approach Judith Abiero, Michael Kimwele, and Geoffrey Chemwa	18
Color Vision Deficiency and Live Recoloring	33
Real Time Handling Occlusion in Augmented Reality Based	
on Photogrammetry	47
Colour Image Encryption Based on Fisher-Yates Algorithm and Chaotic Maps Renjith V. Ravi, S. B. Goyal, and Chawki Djeddi	63
Robust SLAM System by Incorporating UWB Positioning and Landmark Localization	77
Intelligent Systems for Medical Diagnosis	
Deep Learning for Liver Disease Prediction	95
Pre-trained Backbones Effect on Nuclei Segmentation Performance	108
Organ Detection in US Scanning by Non-expert Operator François Derache, Philippe Arbeille, Didier Chaput, and Nicole Vincent	119
Deep Transfer Learning Techniques for Automated Classification of Histological Childhood Medulloblastoma Images	132

A New Medical Image Encryption Algorithm for IoMT Applications	145
Feature Relevance Analysis for Handwriting Based Identification of Parkinson's Disease Saman Khawar, Anum Kaleem, Momina Moetesum, and Imran Siddiqi	158
EEG Based Major Depressive Disorder (MDD) Detection Using Machine Learning Nayab Bashir, Sanam Narejo, Bushra Naz, and Asif Ali	172
Document Analysis and Understanding	
Islamophobic Hate Speech Detection from Electronic Media Using Deep Learning Qasim Mehmood, Anum Kaleem, and Imran Siddiqi	187
A Semi-automatic Document Screening System for Computer Science Systematic Reviews Abdelhakim Hannousse and Salima Yahiouche	201
Handwriting Based Personality Traits Identification Using Adaptive Boosting and Textural Features Abdellatif Gahmousse, Rabeb Yousfi, and Chawki Djeddi	216
An Automated Approach for Analysing Students Feedback Using Sentiment Analysis Techniques Shpetim Sadriu, Krenare Pireva Nuci, Ali Shariq Imran, Imran Uddin, and Muhammad Sajjad	228
Keyword Spotting in Modern Handwritten Documents Using oBIFs Douaa Yousfi, Abdeljalil Gattal, Chawki Djeddi, Imran Siddiqi, and Ameur Bensefia	240
Artificial Intelligence and Intelligent Systems	
Real-Time Detection of Traffic Anomalies Near Roundabouts	253
A Two-Stage Framework for Diverse Traffic Light Recognition Based on Individual Signal Detection	265

Contents	xiii
Enhancing Vehicle Networks Performance by Cache-Aided Non-Orthogonal Multiple Access (CA-NOMA)	279
Performance Analysis of Hard Decision and Soft Decision Algorithms Over In Vivo Radio Channel	288
The Thermal Modeling for Underground Cable Based on ANN Prediction Abdullah Ahmed Al-Dulaimi, Muhammet Tahir Guneser, and Alaa Ali Hameed	301
Layer-Wise Relevance Propagation for Smart-Grid Stability Prediction Türkücan Erdem and Süleyman Eken	315
Abalone Age Prediction Using Machine Learning	329
A Novel Optimized Method for Feature Selection Using Non-linear Kernel-Free Twin Quadratic Surface Support Vector Machine	339
Recognition Algorithm Models Based on the Selection of Two-Dimensional Preference Threshold Functions S. N. Ibragimova, S. S. Radjabov, O. N. Mirzaev, S. A. Tavboyev, and G. R. Mirzaeva	354
Using Keytyping as a Biomarker for Cognitive Decline Diagnostics: The Convolutional Neural Network Based Approach Lucas Salvador Barnardo, Robertas Damasevicius, and Rytis Maskeliunas	367
Author Index	383