Lecture Notes in Computer Science **13364**

More information about this series at https://link.springer.com/bookseries/558

Mounîm El Yacoubi · Eric Granger ·
Pong Chi Yuen · Umapada Pal ·
Nicole Vincent (Eds.)

Pattern Recognition and Artificial Intelligence

Third International Conference, ICPRAI 2022
Paris, France, June 1–3, 2022
Proceedings, Part II

Springer

Editors
Mounîm El Yacoubi
Télécom SudParis
Palaiseau, France

Pong Chi Yuen
Hong Kong Baptist University
Kowloon, Kowloon, Hong Kong

Nicole Vincent
Université Paris Cité
Paris, France

Eric Granger
École de Technologie Supérieure
Montreal, QC, Canada

Umapada Pal
Indian Statistical Institute
Kolkata, India

ISSN 0302-9743 ISSN 1611-3349 (electronic)
Lecture Notes in Computer Science
ISBN 978-3-031-09281-7 ISBN 978-3-031-09282-4 (eBook)
https://doi.org/10.1007/978-3-031-09282-4

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

Preface

Welcome to the proceedings of the third International Conference on Pattern Recognition and Artificial Intelligence (ICPRAI 2022), held during June 1–3, 2022 in Paris, France. This conference follows the successful ICPRAI 2018, held in Montréal, Canada, in May 2018 and ICPRAI 2020, held in Zhongshan, China, in October 2020. It was organized by LIPADE (Laboratoire d'Informatique Paris Descartes) at Université Paris Cité with the co-operation of other French universities. The conference was endorsed by the International Association on Pattern Recognition (IAPR) and we hereby thank the organization for this support.

Pattern recognition and artificial intelligence (PRAI) techniques and systems have been applied successfully to solve practical problems in many domains. ICPRAI 2022 brought together numerous scientists from all over the world to present their innovative ideas, report their latest findings, and discuss the fruitful results of research laboratories in up to 43 countries in handwriting recognition, forensic studies, face recognition, medical imaging, deep learning, and classification techniques.

The Organizing Committee of ICPRAI 2022 consisted of well-known experts from all six (habited) continents of the world. The conference invited world-renowned keynote speakers to cover the new PRAI frontiers in depth and in breadth, and we are grateful for their insights. Due to the large number of high-quality papers submitted (a total of 152 submissions were received), the technical program included 81 presentations, as well as four special sessions, related to handwriting and text processing, computer vision and image processing, machine learning and deep networks, medical applications, forensic science and medical diagnosis, features and classification techniques, and various applications. The paper review process was carried out in a very professional way by the Program Committee members. In addition to the rich technical program, the conference also featured practical sessions, to encourage author-editor and inventor-investor interactions, and social events for all conference participants. A pre-conference doctorial consortium took place on May 31, 2022, as a satellite to the main event, offering PhD students the opportunity to present their work and meet senior researchers in their field of interest.

It was a great pleasure to organize this conference including all the above activities, promoting discussions on very innovative pieces of research work and we would like to thank all those involved for a superb technical program and conference proceedings: conference co-chairs, Edwin Hancock and Yuan Y. Tang; special session chairs, Jenny Benois-Pineau and Raphael Lins; and publication chairs, Camille Kurtz and Patrick Wang, along with all the Program Committee members.

We would like to express our gratitude to the numerous committee members who took care of the arrangement local organization, particularly to Florence Cloppet. Special thanks go to local arrangements team of the Université Paris Cité Faculty of Sciences and particularly to the Mathematics and Computer Science departments. All created a very warm and comfortable environment to work in.

Thanks are also due to the organizations listed in the proceedings and those of the organizers of ICPRAI 2022, along with the administration of Université Paris Cité, who gave us strong financial support and support in various forms and means.

Finally, we hope you found this conference to be a rewarding and memorable experience. We hope you enjoyed your stay in Paris.

April 2022

Ching Y. Suen
Nicole Vincent
Mounîm El Yacoubi
Umapada Pal
Eric Granger
Pong Chi Yuen

Organization

ICPRAI 2022 was hosted by Université Paris Cité and organized by LIPADE (Laboratoire d'Informatique Paris Descartes) of Université Paris Cité, France.

Honorary Chair

Ching Y. Suen	Concordia University, Canada

General Chair

Nicole Vincent	Université Paris Cité, France

Conference Chairs

Edwin Hancock	University of York, UK
Yuan Y. Tang	University of Macau, China

Program Chairs

Mounim El Yacoubi	Institut Polytechnique de Paris, France
Umapada Pal	Indian Statistical Institute, India
Eric Granger	École de technologie supérieure, Canada
Pong C. Yuen	Hong Kong Baptist University, China

Special Sessions Chairs

Jenny Benois-Pineau	Université de Bordeaux, France
Raphael Lins	Universidade Federal de Pernambuco, Brazil

Competition Chairs

Jean-Marc Ogier	La Rochelle Université, France
Cheng-Lin Liu	University of Chinese Academy of Sciences, China

Doctoral Consortium

Véronique Eglin	INSA de Lyon, France
Daniel Lopresti	Lehigh University, USA

Organization Chair

Florence Cloppet	Université de Paris, France

Publication Chairs

Camille Kurtz	Université Paris Cité, France
Patrick Wang	Northeastern University, USA

Exhibitions and Industrial Liaison

Alexandre Cornu	IMDS, Canada
Olivier Martinot	Telecom SudParis, France

Publicity Chairs

Jean-Christophe Burie	La Rochelle Université, France
Imran Siddiqi	Bahria University, Pakistan
Michael Blumenstein	University of Technology Sydney, Australia
Rejean Plamondon	Polytechnique Montréal, Canada

Sponsorship Chairs

Laurence Likforman	Telecom Paris, France
Josep Llados	Universitat Autònoma de Barcelona, Spain
Nicola Nobile	Concordia University, Canada

Web

Camille Kurtz	Université Paris Cité, France

Program Committee

Elisa H. Barney Smith	Boise State University, USA
Jenny Benois-Pineau	LaBRI, CNRS, University of Bordeaux, France
Saumik Bhattacharya	IIT Kanpur, India
Michael Blumenstein	University of Technology Sydney, Australia
Jean-Christophe Burie	L3i, La Rochelle Université, France
Sukalpa Chanda	Østfold University College, Norway
Jocelyn Chanussot	Grenoble INP, France
Christophe Charrier	Normandie Université, France
Rama Chellappa	University of Maryland, USA
Farida Cheriet	Polytechnique Montreal, Canada

Florence Cloppet	LIPADE, Université Paris Cité, France
Alberto Del Bimbo	Università degli Studi di Firenze, Italy
Christian Desrosiers	École de technologie supérieure, Canada
Véronique Eglin	LIRIS, INSA de LYON, France
Mounîm A. El Yacoubi	Institut Polytechnique de Paris, France
Gernot Fink	TU Dortmund University, Germany
Andreas Fischer	University of Fribourg, Switzerland
Robert Fisher	University of Edinburgh, UK
Giorgio Fumera	University of Cagliari, Italy
Basilis Gatos	Institute of Informatics and Telecommunications, National Center for Scientific Research, Demokritos, Greece
Eric Granger	École de technologie supérieure, Canada
Edwin Hancock	University of York, UK
Xiaoyi Jiang	University of Münster, Germany
Xiaoyue Jiang	Northwestern Polytechnical University, China
Camille Kurtz	Université Paris Cité, France
Laurence Likforman-Sulem	LTCI, Télécom Paris, Institut Polytechnique de Paris, France
Rafael Lins	Federal University of Pernambuco, Brazil
Cheng-Lin Liu	Institute of Automation, Chinese Academy of Sciences, China
Josep Llados	Universitat Autònoma de Barcelona, Spain
Daniel Lopresti	Lehigh University, USA
Yue Lu	East China Normal University, China
Khoa Luu	Carnegie Mellon University, USA
Angelo Marcelli	Università di Salerno, Italy
Jean Meunier	University of Montreal, Canada
Atul Negi	University of Hyderabad, India
Jean-Marc Ogier	L3i, University of La Rochelle, France
Wataru Ohyama	Saitama Institute of Technology, Japan
Srikanta Pal	Griffith University, Australia
Umapada Pal	Indian Statistical Institute, India
Nicolas Passat	CReSTIC, Université de Reims Champagne-Ardenne, France
Marius Pedersen	Norwegian University of Science and Technology, Norway
Marco Pedersoli	École de technologie supérieure, Canada
Giuseppe Pirlo	University of Bari, Italy
Ajita Rattani	University of Cagliari, Italy
Kaushik Roy	West Bengal State University, India
Partha Pratim Roy	Indian Institute of Technology, India

Su Ruan	Université de Rouen, France
Friedhelm Schwenker	Ulm University, Germany
Imran Siddiqi	Bahria University, Pakistan
Nicolas Thome	Cnam, France
Massimo Tistarelli	University of Sassari, Italy
Seiichi Uchida	Kyushu University, Japan
Nicole Vincent	Universite de Paris, France
Richard Wilson	University of York, UK
Yirui Wu	Hohai University, China
Vera Yashina	Dorodnicyn Computing Center, Russian Academy of Sciences, Russia
Xiao Feng	Northwestern Polytechnical University, China

Keynote Speakers

ICPRAI 2022 was proud to host the following keynote speakers:

Bidyut B. Chaudhuri	Computer Vision & Pattern Recognition Unit, Indian Statistical Institute, India	"Bengali Handwriting Recognition with Transformative Generative Adversarial Net (TGAN)"
Robert B. Fisher	School of Informatics, University of Edinburgh, Scotland, UK	"The TrimBot2020 outdoor gardening robot"
Walter G. Kropatsch	Vienna University of Technology, Austria	"Controlling Topology-Preserving Graph-Pyramid"

Sponsors


Université
Paris Cité


LIPADE
Laboratoire d'Informatique PAris DEscartes


Sciences
Université Paris Cité


IAPR


World Scientific
www.worldscientific.com


international medias
IMDS
data services


IDEMIA

Contents – Part II

Pattern Recognition

PE-former: Pose Estimation Transformer 3
Paschalis Panteleris and Antonis Argyros

ConDense: Multiple Additional Dense Layers with Fine-Grained Fully-Connected Layer Optimisation for Fingerprint Recognition 15
Dane Lang and Dustin van der Haar

A Sensor-Independent Multimodal Fusion Scheme for Human Activity Recognition 28
Anastasios Alexiadis, Alexandros Nizamis, Dimitrios Giakoumis, Konstantinos Votis, and Dimitrios Tzovaras

Comparative Study of Activation Functions and Their Impact on the YOLOv5 Object Detection Model 40
John Doherty, Bryan Gardiner, Emmett Kerr, Nazmul Siddique, and Sunilkumar S. Manvi

Application of A* to the Generalized Constrained Longest Common Subsequence Problem with Many Pattern Strings 53
Marko Djukanovic, Dragan Matic, Christian Blum, and Aleksandar Kartelj

Robot Path Planning Method Based on Improved Grey Wolf Optimizer 65
Yilin Su, Yongsheng Li, Lina Ge, and Minjun Dai

Space-Time Memory Networks for Multi-person Skeleton Body Part Detection 78
Rémi Dufour, Cyril Meurie, Olivier Lézoray, and Ankur Mahtani

Lip-Based Identification Using YOLOR 91
Wardah Farrukh and Dustin van der Haar

Parallel $\mathcal{O}(log(n))$ Computation of the Adjacency of Connected Components 102
Majid Banaeyan and Walter G. Kropatsch

Encoding Sensors' Data into Images to Improve the Activity Recognition in Post Stroke Rehabilitation Assessment 114
Issam Boukhennoufa, Xiaojun Zhai, Victor Utti, Jo Jackson, and Klaus D. McDonald-Maier

Momentum Residual Embedding with Angular Marginal Loss for Plant Pathogen Biometrics 124
Shitala Prasad, Pankaj Pratap Singh, and Piyush Kumar

Classification

Hierarchical Approach for the Classification of Multi-class Skin Lesions Based on Deep Convolutional Neural Networks 139
Samia Benyahia, Boudjelal Meftah, and Olivier Lézoray

The FreshPRINCE: A Simple Transformation Based Pipeline Time Series Classifier 150
Matthew Middlehurst and Anthony Bagnall

Robust Detection of Conversational Groups Using a Voting Scheme and a Memory Process 162
Victor Fortier, Isabelle Bloch, and Catherine Pélachaud

Fusing AutoML Models: A Case Study in Medical Image Classification 174
Melissa Dale, Arun Ross, and Erik M. Shapiro

Ordinal Classification and Regression Techniques for Distinguishing Neutrophilic Cell Maturity Stages in Human Bone Marrow 186
Philipp Gräbel, Martina Crysandt, Barbara M. Klinkhammer, Peter Boor, Tim H. Brümmendorf, and Dorit Merhof

Towards Automated Monitoring of Parkinson's Disease Following Drug Treatment 196
Amir Dehsarvi, Jennifer Kay South Palomares, and Stephen Leslie Smith

A Hierarchical Prototypical Network for Few-Shot Remote Sensing Scene Classification 208
Manal Hamzaoui, Laetitia Chapel, Minh-Tan Pham, and Sébastien Lefèvre

TS-QUAD: A Smaller Elastic Ensemble for Time Series Classification with No Reduction in Accuracy 221
Jason Lines and George Oastler

Machine Learning

Shop Signboards Detection Using the ShoS Dataset 235
Mrouj Almuhajri and Ching Y. Suen

One-Shot Decoupled Face Reenactment with Vision Transformer 246
Chen Hu and Xianghua Xie

ADG-Pose: Automated Dataset Generation for Real-World Human Pose Estimation 258
Ghazal Alinezhad Noghre, Armin Danesh Pazho, Justin Sanchez, Nathan Hewitt, Christopher Neff, and Hamed Tabkhi

Deep Reinforcement Learning for Autonomous Navigation in Robotic Wheelchairs 271
Sotirios Chatzidimitriadis and Konstantinos Sirlantzis

Understanding Individual Neurons of ResNet Through Improved Compositional Formulas 283
Rafael Harth

Visual Transformer-Based Models: A Survey 295
Xiaonan Huang, Ning Bi, and Jun Tan

Stochastic Pairing for Contrastive Anomaly Detection on Time Series 306
Guillaume Chambaret, Laure Berti-Equille, Frédéric Bouchara, Emmanuel Bruno, Vincent Martin, and Fabien Chaillan

Visual Radial Basis Q-Network 318
Julien Hautot, Céline Teuliere, and Nourddine Azzaoui

GANs Based Conditional Aerial Images Generation for Imbalanced Learning 330
Itzel Belderbos, Tim de Jong, and Mirela Popa

Augment Small Training Sets Using Matching-Graphs 343
Mathias Fuchs and Kaspar Riesen

Progressive Clustering: An Unsupervised Approach Towards Continual Knowledge Acquisition of Incremental Data 355
Akshaykumar Gunari, Shashidhar V. Kudari, Ramesh Ashok Tabib, and Uma Mudenagudi

Malware Detection Using Pseudo Semi-Supervised Learning 368
Upinder Kaur, Xin Ma, Richard M. Voyles, and Byung-Cheol Min

Information Extraction

Temporal Disaggregation of the Cumulative Grass Growth 383
Thomas Guyet, Laurent Spillemaecker, Simon Malinowski, and Anne-Isabelle Graux

Extraction of Entities in Health Domain Documents Using Recurrent Neural Networks 395
Erick Barrios González, Mireya Tovar Vidal, Guillermo De Ita Luna, and José A. Reyes-Ortiz

An Overview of Methods and Tools for Extraction of Knowledge for COVID-19 from Knowledge Graphs 407
Mariya Evtimova-Gardair and Nedra Mellouli

Explaining Image Classifications with Near Misses, Near Hits and Prototypes: Supporting Domain Experts in Understanding Decision Boundaries 419
Marvin Herchenbach, Dennis Müller, Stephan Scheele, and Ute Schmid

Adaptive Threshold for Anomaly Detection in ATM Radar Data Streams 431
Achraf Krim Rahaoui, Théobald de Riberolles, and Jiefu Song

Covid-19 Vaccine Sentiment Analysis During Second Wave in India by Transfer Learning Using XLNet 443
Anmol Bansal, Seba Susan, Arjun Choudhry, and Anubhav Sharma

Improving Drift Detection by Monitoring Shapley Loss Values 455
Bastien Zimmermann and Matthieu Boussard

Interpolation Kernel Machine and Indefinite Kernel Methods for Graph Classification 467
Jiaqi Zhang, Cheng-Lin Liu, and Xiaoyi Jiang

DRN: Detection and Removal of Noisy Instances with Self Organizing Map ... 480
Rashida Hasan and Chee-Hung Henry Chu

Informativeness in Twitter Textual Contents for Farmer-centric Plant Health Monitoring 492
Shufan Jiang, Rafael Angarita, Stéphane Cormier, Julien Orensanz, and Francis Rousseaux

A Deep Learning Approach to Detect Ventilatory Over-Assistance 504
Emmanouil Sylligardos, Markos Sigalas, Stella Soundoulounaki, Katerina Vaporidi, and Panos Trahanias

Author Index 517

Contents – Part I

Computer Vision

Identifying, Evaluating, and Addressing Nondeterminism in Mask R-CNNs 3
Stephen Price and Rodica Neamtu

Structure-Aware Photorealistic Style Transfer Using Ghost Bottlenecks 15
Nhat-Tan Bui, Ngoc-Thao Nguyen, and Xuan-Nam Cao

Analysing the Impact of Vibrations on Smart Wheelchair Systems and Users ... 25
Elhassan Mohamed, Konstantinos Sirlantzis, and Gareth Howells

Visual Microfossil Identification via Deep Metric Learning 34
Tayfun Karaderi, Tilo Burghardt, Allison Y. Hsiang, Jacob Ramaer, and Daniela N. Schmidt

QAP Optimisation with Reinforcement Learning for Faster Graph Matching in Sequential Semantic Image Analysis 47
Jérémy Chopin, Jean-Baptiste Fasquel, Harold Mouchère, Rozenn Dahyot, and Isabelle Bloch

Towards a Unified Benchmark for Monocular Radial Distortion Correction and the Importance of Testing on Real-World Data 59
Christoph Theiß and Joachim Denzler

Comparing Artificial Intelligence Algorithms in Computer Vision: The Weapon Detection Benchmark 72
Vincenzo Dentamaro, Paolo Giglio, Donato Impedovo, and Giuseppe Pirlo

Metrics for Saliency Map Evaluation of Deep Learning Explanation Methods 84
Tristan Gomez, Thomas Fréour, and Harold Mouchère

Image Classification via Multi-branch Position Attention Network 96
Ke Zhang, Jun Yang, Kun Yuan, Qing-Song Wei, and Si-Bao Chen

UGQE: Uncertainty Guided Query Expansion 109
Firat Oncel, Mehmet Aygün, Gulcin Baykal, and Gozde Unal

Controlling the Quality of GAN-Based Generated Images for Predictions Tasks 121
Hajar Hammouch, Mounim El-Yacoubi, Huafeng Qin, Hassan Berbia, and Mohamed Chikhaoui

A Framework for Registration of Multi-modal Spatial Transcriptomics Data . . . 134
Yu Qiang, Shixu He, Renpeng Ding, Kailong Ma, Yong Hou, Yan Zhou, and Karl Rohr

Extracting and Classifying Salient Fields of View from Microscopy Slides of Tuberculosis Bacteria 146
Marios Zachariou, Ognjen Arandjelović, Evelin Dombay, Wilber Sabiiti, Bariki Mtafya, and Derek Sloan

Segmentation

Deep Learning for Fast Segmentation of E-waste Devices' Inner Parts in a Recycling Scenario 161
Cristof Rojas, Antonio Rodríguez-Sánchez, and Erwan Renaudo

Improving Semantic Segmentation with Graph-Based Structural Knowledge 173
Jérémy Chopin, Jean-Baptiste Fasquel, Harold Mouchère, Rozenn Dahyot, and Isabelle Bloch

Application of Rail Segmentation in the Monitoring of Autonomous Train's Frontal Environment 185
Mohamed Amine Hadded, Ankur Mahtani, Sébastien Ambellouis, Jacques Boonaert, and Hazem Wannous

DR-VNet: Retinal Vessel Segmentation via Dense Residual UNet 198
Ali Karaali, Rozenn Dahyot, and Donal J. Sexton

Dealing with Incomplete Land-Cover Database Annotations Applied to Satellite Image Time Series Semantic Segmentation 211
Lucas Colomines, Camille Kurtz, Anne Puissant, and Nicole Vincent

On the Feasibility and Generality of Patch-Based Adversarial Attacks on Semantic Segmentation Problems 223
Soma Kontár and András Horváth

Unsupervised Cell Segmentation in Fluorescence Microscopy Images via Self-supervised Learning 236
Carola Krug and Karl Rohr

Document

Hypercomplex Generative Adversarial Networks for Lightweight Semantic Labeling 251
Giorgos Sfikas, George Retsinas, Basilis Gatos, and Christophoros Nikou

Learning Document Graphs with Attention for Image Manipulation Detection 263
Hailey James, Otkrist Gupta, and Dan Raviv

Modular StoryGAN with Background and Theme Awareness for Story Visualization 275
Gábor Szűcs and Modafar Al-Shouha

Is On-Line Handwriting Gender-Sensitive? What Tells us a Combination of Statistical and Machine Learning Approaches 287
Laurence Likforman-Sulem, Gennaro Cordasco, and Anna Esposito

Using Convolutional Neural Network to Handle Word Shape Similarities in Handwritten Cursive Arabic Scripts of Pashto Language 299
Muhammad Ismail Shah and Ching Y. Suen

Discriminatory Expressions to Improve Model Comprehensibility in Short Documents 311
Manuel Francisco and Juan Luis Castro

Scene Text Recognition: An Overview 323
Shiqi Liang, Ning Bi, and Jun Tan

An Encoder-Decoder Approach to Offline Handwritten Mathematical Expression Recognition with Residual Attention 335
Qiqiang Lin, Chunyi Wang, Ning Bi, Ching Y. Suen, and Jun Tan

Hologram Detection for Identity Document Authentication 346
Oumayma Kada, Camille Kurtz, Cuong van Kieu, and Nicole Vincent

A New Deep Fuzzy Based MSER Model for Multiple Document Images Classification 358
Kunal Biswas, Palaiahnakote Shivakumara, Sittravell Sivanthi, Umapada Pal, Yue Lu, Cheng-Lin Liu, and Mohamad Nizam Bin Ayub

Video – 3D

Multi-view Monocular Depth and Uncertainty Prediction with Deep SfM in Dynamic Environments 373
Christian Homeyer, Oliver Lange, and Christoph Schnörr

Fourier Domain CT Reconstruction with Complex Valued Neural Networks . . . 386
Zoltán Domokos and László G. Varga

Seeking Attention: Using Full Context Transformers for Better Disparity Estimation 398
Nadir Bengana, Janne Mustaniemi, and Janne Heikkilä

Inpainting Applied to Facade Images: A Comparison of Algorithms 410
Willy Fritzsche, Steffen Goebbels, Simon Hensel, Marco Rußinski, and Nils Schuch

Self-distilled Self-supervised Depth Estimation in Monocular Videos 423
Julio Mendoza and Helio Pedrini

Improving UWB Image Reconstruction for Breast Cancer Diagnosis by Doing an Iterative Analysis of Radar Signals 435
Henrry Adrian Torres-Quispe and Raquel Esperanza Patino-Escarcina

Personalized Frame-Level Facial Expression Recognition in Video 447
Andrey V. Savchenko

3D Reconstruction of Medical Image Based on Improved Ray Casting Algorithm 459
Wang Yu and Gong Ning

Lateral Ego-Vehicle Control Without Supervision Using Point Clouds 477
Florian Müller, Qadeer Khan, and Daniel Cremers

RDMMLND: A New Robust Deep Model for Multiple License Plate Number Detection in Video 489
Amish Kumar, Palaiahnakote Shivakumara, and Umapada Pal

Generative Target Update for Adaptive Siamese Tracking 502
Madhu Kiran, Le Thanh Nguyen-Meidine, Rajat Sahay, Rafael Menelau Oliveira E Cruz, Louis-Antoine Blais-Morin, and Eric Granger

From Synthetic to One-Shot Regression of Camera-Agnostic Human Performances 514
Julian Habekost, Kunkun Pang, Takaaki Shiratori, and Taku Komura

Feature

Computation of 2D Discrete Geometric Moments Through Inclusion-Exclusion 529
Lidija Čomić and Paola Magillo

Feature Subset Selection for Detecting Fatigue in Runners Using Time Series Sensor Data 541
Bahavathy Kathirgamanathan, Cillian Buckley, Brian Caulfield, and Pádraig Cunningham

Compositing Foreground and Background Using Variational Autoencoders 553
Zezhen Zeng, Jonathon Hare, and Adam Prügel-Bennett

Unsupervised Representation Learning via Information Compression 567
Zezhen Zeng, Jonathon Hare, and Adam Prügel-Bennett

Remote Sensing Scene Classification Based on Covariance Pooling of Multi-layer CNN Features Guided by Saliency Maps 579
Sara Akodad, Lionel Bombrun, Christian Germain, and Yannick Berthoumieu

Attention Embedding ResNet for Pest Classification 591
Jinglin Wu, Shiqi Liang, Ning Bi, and Jun Tan

Multi Layered Feature Explanation Method for Convolutional Neural Networks 603
Luca Bourroux, Jenny Benois-Pineau, Romain Bourqui, and Romain Giot

Bayesian Gate Mechanism for Multi-task Scale Learning 615
Shihao Wang and Hongwei Ge

ASRSNet: Automatic Salient Region Selection Network for Few-Shot Fine-Grained Image Classification 627
Yi Liao, Weichuan Zhang, Yongsheng Gao, Changming Sun, and Xiaohan Yu

Face Age Progression with Attribute Manipulation 639
Sinzith Tatikonda, Athira Nambiar, and Anurag Mittal

Random Dilated Shapelet Transform: A New Approach for Time Series Shapelets 653
Antoine Guillaume, Christel Vrain, and Wael Elloumi

Guiding Random Walks by Effective Resistance for Effective Node Embedding 665
Abderaouf Gacem, Mohammed Haddad, Hamida Seba, Gaetan Berthe, and Michel Habib

An Oculomotor Digital Parkinson Biomarker from a Deep Riemannian Representation 677
Juan Olmos, Antoine Manzanera, and Fabio Martínez

Pruning Neural Nets by Optimal Neuron Merging 688
Felix Goldberg, Yackov Lubarsky, Alexei Gaissinski, Dan Botchan, and Pavel Kisilev

Author Index 701