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Image Analysis and Processing

ICIAP 2022 Workshops

ICIAP International Workshops
Lecce, Italy, May 23–27, 2022
Revised Selected Papers, Part II

2
Part II

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Revised Selected Papers, Part II

Editors

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Preface

This volume contains 47 of the papers accepted for presentation at the workshops hosted by the 21st International Conference on Image Analysis and Processing (ICIAP 2022), held in Lecce, Italy, during May 23–27, 2022. ICIAP is organized every two years by CVPL, the group of Italian researchers affiliated with the International Association for Pattern Recognition (IAPR). The aim of the conference is to bring together researchers working on image processing, computer vision, and pattern recognition from around the world. Topics traditionally covered are related to computer vision, pattern recognition, and image processing, addressing both theoretical and applicative aspects.

In total, 16 different workshops were selected to complement ICIAP 2022 in Lecce. All the 16 workshops have received a total of 157 submissions, and after a peer-review selection process, carried out by the individual workshop organizers, ultimately led to the selection of 96 papers, with an overall acceptance rate of 61%.

This volume contains 47 papers (out of 96) from the following workshops:

- Medical Imaging Analysis for Covid-19 (MIA COVID)
- Artificial Intelligence for preterm infants' healthCare (AI-Care)
- Binary is the new Black (and White): Recent Advances on Binary Image Processing
- Towards a Complete Analysis of People: From Face and Body to Clothes (T-CAP)
- Workshop on Small-Drone Surveillance, Detection and Counteraction Techniques (WOSDETC)
- Artificial Intelligence for Digital Humanities (AI4DH)
- Human Behavior Analysis for Smart City Environment Safety (HBAXSCES)
- Learning in Precision Livestock Farming (LPLF)
- Novel Benchmarks and Approaches for Real-World Continual Learning (CL4REAL)
- Medical Transformers (MEDXF)

The papers accepted for the other workshops are included in the companion volume (LNCS 13373).

Medical Imaging Analysis for Covid-19 (MIA COVID), organized by Fares Bougourzi (ISASI-CNR, Italy), Cosimo Distanto (ISASI-CNR, Italy), Abdelmalik Taleb-Ahmed (Université Polytechnique Hauts-de-France, France), Fadi Dornaika (University of the Basque Country, Spain), and Abdenour Hadid (Université Polytechnique Hauts-de-France, France), provided an overview of the potential applications of AI in combating this pandemic using medical imaging methods.

Artificial Intelligence for preterm infants' healthCare (AI-Care), organized by Sara Moccia (Scuola Superiore Sant'Anna, Pisa, Italy) along with Emanuele Frontoni and Lucia Migliorelli (Università Politecnica delle Marche, Italy), aimed to group expert AI researchers in the field of preterm infant monitoring to discuss the most recent research work and highlight current challenges and needs.

Binary is the new Black (and White): Recent Advances on Binary Image Processing covered anything using, implementing, or improving binary image analysis, a specific

area of image processing, which is less mainstream nowadays, but which still supports most computer vision systems implementations. It was organized by Costantino Grana and Federico Bolelli (Università degli Studi di Modena e Reggio Emilia, Italy).

Towards a Complete Analysis of People: From Face and Body to Clothes (T-CAP), organized by Mohamed Daoudi (IMT Nord Europe, France), Roberto Vezzani (Università degli Studi di Modena e Reggio Emilia, Italy), Marcella Cornia (Università degli Studi di Modena e Reggio Emilia, Italy), Guido Borghi (Università di Bologna, Italy), Claudio Ferrari, (Università di Parma, Italy), Federico Becattini (Università di Firenze, Italy), and Andrea Pilzer (Aalto University, Finland), aimed to improve the communication between researchers and companies and to develop novel ideas that can shape the future of this area, in terms of motivations, methodologies, prospective trends, and potential industrial applications.

The Workshop on Small-Drone Surveillance, Detection and Counteraction Techniques (WOSDETC) aimed at bringing together researchers from both academia and industry, to share recent advances in this field. It was organized by Angelo Coluccia (Università del Salento, Italy), Alessio Fascista (Università del Salento, Italy), Arne Schumann (Fraunhofer IOSB, Germany), Lars Sommer (Fraunhofer IOSB, Germany), Anastasios Dimou (Information Technologies Institute, Greece), Dimitrios Zarpalas (Information Technologies Institute, Greece) Nabin Sharma (University of Technology Sydney, Australia), and Mrunalini Nalamat (University of Technology Sydney, Australia).

Artificial Intelligence for Digital Humanities (AI4DH) aimed to encourage and highlight novel strategies and original research in applying artificial intelligence techniques in digital humanities research, such as data discovery, digital data creation, management, data analytics in literature, linguistics, culture heritage, media, social science, history, music and acoustics, and artificial intelligence for digital humanities in pedagogy and academic curricula. It was organized by Marina Paolanti and Emanuele Frontoni (Università Politecnica delle Marche, Italy), Francesca Matrone (Politecnico di Torino, Italy), and Silvia Cascianelli, Marcella Cornia, and Lorenzo Baraldi (Università degli Studi di Modena e Reggio Emilia, Italy).

Human Behavior Analysis for Smart City Environment Safety (HBxSCES) focused on smart cities that aim to ensure secure and safe physical and digital environments for the well-being of citizens. Among other things, ICT systems are reliant on evolving artificial intelligence, pattern recognition, computer vision, 3D simulations and digital twin techniques to make environments more resilient. This workshop was organized by Alessandro Bruno, Zoheir Sabeur, Deniz Chetinkaya, Muntadher Sallal, and Banafshe Arbab-Zavar (Bournemouth University, UK).

Learning in Precision Livestock Farming (LPLF) aimed to attract novel and original contributions on the analysis, study, and proposal of innovative machine and deep learning techniques applied to the automatic monitoring of animals in intensive farms, helping to improve the living conditions of the animals. It was organized by Simone Palazzo, Simona Porto, Claudia Arcidiacono, and Giulia Castagnolo (Università di Catania, Italy) together with Marcella Guarino (Università di Milano, Italy).

Novel Benchmarks and Approaches for Real-World Continual Learning (CL4REAL), organized by Simone Palazzo and Giovanni Bellitto (Università di Catania,

Italy), Angelo Porrello and Matteo Boschini (Università degli Studi di Modena e Reggio Emilia, Italy), and Vincenzo Lomonaco (Università di Pisa, Italy), aimed to attract novel and original contributions exploring the intersection of continual learning and real-world applications.

Medical Transformers (MEDXF) focused on the employment of transformer architectures for medical imaging, with the objective of extending the state of the art of this topic, presenting novel solutions to typical problems in medical image analysis and, just as importantly, investigating the limits and pitfalls of these new techniques in specific and socially-critical domains. It was organized by Ulas Bagc and Zheyuan Zhang (Northwestern University, USA) along with Simone Palazzo and Federica Proietto Salanitri (Università di Catania, Italy).

We warmly thank all the workshop organizers who made such an interesting program possible and we hope that ICIAP 2022 has given us a chance to design a future where technologies allow people to live comfortably, healthily, and in peace.

May 2022

Pier Luigi Mazzeo
Emanuele Frontoni

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