2nd International Conference on Image Processing and Vision Engineering (IMPROVE 2022)

Online 22 - 24 April 2022

Editors:

Francisco Imai Cosimo Distante Sebastiano Battiato

ISBN: 978-1-7138-5299-5

Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright $\ \bigcirc \ (2022)$ by SCITEPRESS – Science and Technology Publications, Lda. All rights reserved.

Printed with permission by Curran Associates, Inc. (2022)

For permission requests, please contact SCITEPRESS – Science and Technology Publications, Lda. at the address below.

SCITEPRESS – Science and Technology Publications, Lda. Avenida de S. Francisco Xavier, Lote 7 Cv. C, 2900-616 Setúbal, Portugal

Phone: +351 265 520 185 Fax: +351 265520 186

info@scitepress.org

Additional copies of this publication are available from:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 USA Phone: 845-758-0400

Fax: 845-758-2633

Email: curran@proceedings.com Web: www.proceedings.com

CONTENTS

INVITED SPEAKERS

KEYNOTE SPEAKERS	
Robust Fitting in Computer Vision Jiri Matas	5
Neural Diffusion PDEs, Differential Geometry, and Graph Neural Networks <i>Michael Bronstein</i>	7
Semantic Information Pursuit René Vidal	9
Challenges and Opportunities in Autonomous Navigation Jana Kosecka	11
PAPERS	
FULL PAPERS	
Real-time Arabic Sign Language Recognition based on YOLOv5 Sabrina Aiouez, Anis Hamitouche, Mohamed Sabri Belmadoui, Khadidja Belattar and Feryel Souami	17
Detecting Tourette's Syndrome in Anatomical Regions of the Brain through MRI Analysis and Naive Bayes Classifier Murilo Costa De Barros, Kaue Tartarotti Nepomuceno Duarte, Wang-Tso Lee, Chia-Jui Hsu and Marco Antonio Garcia De Carvalho	26
An Image Quality Assessment Method based on Sparse Neighbor Significance Selcuk Ilhan Aydi	34
Transfer Learning Gaussian Anomaly Detection by Fine-tuning Representations Oliver Rippel, Arnav Chavan, Chucai Lei and Dorit Merhof	45
Reversible Fragile Medical Image Watermarking Scheme Resistant to Malicious Tampering Attacks Victor Fedoseev and Anna Denisova	57
Assessment of Dose Reduction Strategies in Wavelength-selective Neutron Tomography Victoria H. DiStefano, Jacob M. LaManna, David L. Jacobson, Paul A. Kienzle, Daniel S. Hussey and Peter Bajcsy	66
BBBD: Bounding Box Based Detector for Occlusion Detection and Order Recovery Kaziwa Saleh and Zoltán Vámossy	78
Image-based Lesion Classification using Deep Neural Networks Ákos Hermann and Zoltán Vámossy	85

SHORT PAPERS

Removing Automatically the Ambiguity in Wind Direction Retrieved from SAR Images Maria Conceição da Proença	93
Objects Motion Detection in Domain-adapted Assisted Driving Francesco Rundo, Roberto Leotta and Sebastiano Battiato	101
Advanced Assisted Car Driving in Low-light Scenarios Francesco Rundo, Roberto Leotta, Angelo Messina and Sebastiano Battiato	109
Student Engagement from Video using Unsupervised Domain Adaptation Chinchu Thomas, Seethamraju Purvaj and Dinesh Babu Jayagopi	118
Two-step Data Augmentation for Masked Face Detection and Recognition: Turning Fake Masks to Real Yan Yang Aaren, George Bebis and Mircea Nicolescu	126
ANNs Dream of Augmented Sheep: An Artificial Dreaming Algorithm Gustavo Assunção, Miguel Castelo-Branco and Paulo Menezes	135
Simulation-to-Reality Domain Adaptation for Offline 3D Object Annotation on Pointclouds with Correlation Alignment Weishuang Zhang, B. Ravi Kiran, Thomas Gauthier, Yanis Mazouz and Theo Steger	142
Data Fusion of PRISMA Satellite Imagery for Asbestos-containing Materials: An Application on Balangero's Mine Site (Italy) Giuseppe Bonifazi, Giuseppe Capobianco, Riccardo Gasbarrone, Silvia Serranti, Sergio Bellagamba and Daniele Taddei	150
Real-Time 3D Object Detection and Recognition using a Smartphone Jin Chen and Zhigang Zhu	158
Aircraft Type Recognition in Remote Sensing Images using Mean Interval Kernel Jaya Sharma, Rajeshreddy Datla, Yenduri Sravani, Vishnu Chalavadi and Krishna Mohan C.	166
An Improved YOLOv5 for Real-time Mini-UAV Detection in No Fly Zones Tijeni Delleji and Zied Chtourou	174
Classification of EEG Motor Imagery Tasks Utilizing 2D Temporal Patterns with Deep Learning Anup Ghimire and Kazim Sekeroglu	182
Applying Genetic Algorithm and Image Quality Assessment for Reproducible Processing of Low-light Images Olivier Parisot and Thomas Tamisier	189
Using Keypoint Matching and Interactive Self Attention Network to Verify Retail POSMs Harshita Seth, Sonaal Kant and Muktabh Mayank Srivastava	195
UAV Path Planning based on Road Extraction Chang Liu and Tamás Szirányi	202
Detection, Tracking, and Speed Estimation of Vehicles: A Homography-based Approach Kaleb Blankenship and Sotirios Diamantas	211

Source Attribution of Modern Multi-camera Smartphones Manoranjan Mohanty	219
Relighting Backlight and Spotlight Images using the von Kries Model Michela Lecca	226
Improved Assessment of Offshore Helideck Marking Standards' Compliance using Optimized Machine Learning Principles in the U.S. Gulf of Mexico Mitchell Bosman, Kazim Sekeroglu and Ghassan Alkadi	234
SPECIAL SESSION ON NEW DEVELOPMENTS IN IMAGING FOR OCULAR AND NEURODEGENERATIVE DISORDERS	
FULL PAPERS	
Shedding Light on Early Central Nervous System Changes for Alzheimer's Disease through the Retina: An Animal Study Rui Bernardes, Hugo Ferreira, Pedro Guimarães and Pedro Serranho	247
On the Numerical Solution of the Inverse Elastography Problem for Time-harmonic Excitation Pedro Serranho, Sílvia Barbeiro, Rafael Henriques, Ana Batista, Mário J. Santos, Carlos Correia, José P. Domingues, Custódio Loureiro, João M. R. Cardoso, Rui Bernardes and Miguel Morgado	259
On the Helmholtz's Equation Model for Light Propagation in the Cornea Adérito Araújo, Sílvia Barbeiro and Milene Santos	265
Swept-source Phase-Stabilized Optical Coherence Tomography Setup for Elastography Ana Batista, Carlos Correia, Sílvia Barbeiro, João Cardoso, José P. Domingues, Rafael Henriques, Custódio Loureiro, Mário J. Santos, Pedro Serranho, Rui Bernardes and Miguel Morgado	269
AUTHOR INDEX	275