

Leonid Karlinsky
Tomer Michaeli
Ko Nishino (Eds.)

LNCS 13807

Computer Vision – ECCV 2022 Workshops

Tel Aviv, Israel, October 23–27, 2022
Proceedings, Part VII

7
Part VII

ECCV
TEL AVIV 2022

 Springer

MOREMEDIA 

Founding Editors

Gerhard Goos

Karlsruhe Institute of Technology, Karlsruhe, Germany

Juris Hartmanis

Cornell University, Ithaca, NY, USA


Editorial Board Members

Elisa Bertino

Purdue University, West Lafayette, IN, USA

Wen Gao

Peking University, Beijing, China

Bernhard Steffen 

TU Dortmund University, Dortmund, Germany

Moti Yung 

Columbia University, New York, NY, USA

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

Leonid Karlinsky · Tomer Michaeli ·
Ko Nishino (Eds.)

Computer Vision – ECCV 2022 Workshops

Tel Aviv, Israel, October 23–27, 2022
Proceedings, Part VII

Editors

Leonid Karlinsky
IBM Research - MIT-IBM Watson AI Lab
Massachusetts, USA

Tomer Michaeli 
Technion – Israel Institute of Technology
Haifa, Israel

Ko Nishino 
Kyoto University
Kyoto, Japan

ISSN 0302-9743 ISSN 1611-3349 (electronic)
Lecture Notes in Computer Science
ISBN 978-3-031-25081-1 ISBN 978-3-031-25082-8 (eBook)
<https://doi.org/10.1007/978-3-031-25082-8>

© The Editor(s) (if applicable) and The Author(s), under exclusive license
to Springer Nature Switzerland AG 2023

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

Foreword

Organizing the European Conference on Computer Vision (ECCV 2022) in Tel-Aviv during a global pandemic was no easy feat. The uncertainty level was extremely high, and decisions had to be postponed to the last minute. Still, we managed to plan things just in time for ECCV 2022 to be held in person. Participation in physical events is crucial to stimulating collaborations and nurturing the culture of the Computer Vision community.

There were many people who worked hard to ensure attendees enjoyed the best science at the 17th edition of ECCV. We are grateful to the Program Chairs Gabriel Brostow and Tal Hassner, who went above and beyond to ensure the ECCV reviewing process ran smoothly. The scientific program included dozens of workshops and tutorials in addition to the main conference and we would like to thank Leonid Karlinsky and Tomer Michaeli for their hard work. Finally, special thanks to the web chairs Lorenzo Baraldi and Kosta Derpanis, who put in extra hours to transfer information fast and efficiently to the ECCV community.

We would like to express gratitude to our generous sponsors and the Industry Chairs Dimosthenis Karatzas and Chen Sagiv, who oversaw industry relations and proposed new ways for academia-industry collaboration and technology transfer. It's great to see so much industrial interest in what we're doing!

Authors' draft versions of the papers appeared online with open access on both the Computer Vision Foundation (CVF) and the European Computer Vision Association (ECVA) websites as with previous ECCVs. Springer, the publisher of the proceedings, has arranged for archival publication. The final version of the papers is hosted by SpringerLink, with active references and supplementary materials. It benefits all potential readers that we offer both a free and citeable version for all researchers, as well as an authoritative, citeable version for SpringerLink readers. Our thanks go to Ronan Nugent from Springer, who helped us negotiate this agreement. Last but not least, we wish to thank Eric Mortensen, our publication chair, whose expertise made the process smooth.

October 2022

Rita Cucchiara
 Jiří Matas
 Amnon Shashua
 Lihi Zelnik-Manor

Preface

Welcome to the workshop proceedings of the 17th European Conference on Computer Vision (ECCV 2022). This year, the main ECCV event was accompanied by 60 workshops, scheduled between October 23–24, 2022. We received 103 workshop proposals on diverse computer vision topics and unfortunately had to decline many valuable proposals because of space limitations. We strove to achieve a balance between topics, as well as between established and new series. Due to the uncertainty associated with the COVID-19 pandemic around the proposal submission deadline, we allowed two workshop formats: hybrid and purely online. Some proposers switched their preferred format as we drew near the conference dates. The final program included 30 hybrid workshops and 30 purely online workshops. Not all workshops published their papers in the ECCV workshop proceedings, or had papers at all. These volumes collect the edited papers from 38 out of the 60 workshops. We sincerely thank the ECCV general chairs for trusting us with the responsibility for the workshops, the workshop organizers for their hard work in putting together exciting programs, and the workshop presenters and authors for contributing to ECCV.

October 2022

Tomer Michaeli
Leonid Karlinsky
Ko Nishino

Organization

General Chairs

Rita Cucchiara
Jiří Matas

University of Modena and Reggio Emilia, Italy
Czech Technical University in Prague,
Czech Republic

Amnon Shashua
Lihi Zelnik-Manor

Hebrew University of Jerusalem, Israel
Technion – Israel Institute of Technology, Israel

Program Chairs

Shai Avidan
Gabriel Brostow
Giovanni Maria Farinella
Tal Hassner

Tel-Aviv University, Israel
University College London, UK
University of Catania, Italy
Facebook AI, USA

Program Technical Chair

Pavel Lifshits

Technion – Israel Institute of Technology, Israel

Workshops Chairs

Leonid Karlinsky
Tomer Michaeli
Ko Nishino

IBM Research - MIT-IBM Watson AI Lab, USA
Technion – Israel Institute of Technology, Israel
Kyoto University, Japan

Tutorial Chairs

Thomas Pock
Natalia Neverova

Graz University of Technology, Austria
Facebook AI Research, UK

Demo Chair

Bohyung Han

Seoul National University, South Korea

Social and Student Activities Chairs

Tatiana Tommasi
Sagie Benaim

Italian Institute of Technology, Italy
University of Copenhagen, Denmark

Diversity and Inclusion Chairs

Xi Yin Facebook AI Research, USA
Bryan Russell Adobe, USA

Communications Chairs

Lorenzo Baraldi University of Modena and Reggio Emilia, Italy
Kosta Derpanis York University and Samsung AI Centre Toronto, Canada

Industrial Liaison Chairs

Dimosthenis Karatzas Universitat Autònoma de Barcelona, Spain
Chen Sagiv SagivTech, Israel

Finance Chair

Gerard Medioni University of Southern California and Amazon, USA

Publication Chair

Eric Mortensen MiCROTEC, USA

Workshops Organizers

W01 - AI for Space

Tat-Jun Chin The University of Adelaide, Australia
Luca Carlone Massachusetts Institute of Technology, USA
Djamila Aouada University of Luxembourg, Luxembourg
Binfeng Pan Northwestern Polytechnical University, China
Viorela Ila The University of Sydney, Australia
Benjamin Morrell NASA Jet Propulsion Lab, USA
Grzegorz Kakareko Spire Global, USA

W02 - Vision for Art

Alessio Del Bue Istituto Italiano di Tecnologia, Italy
Peter Bell Philipps-Universität Marburg, Germany
Leonardo L. Impett École Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Noa Garcia Osaka University, Japan
Stuart James Istituto Italiano di Tecnologia, Italy

W03 - Adversarial Robustness in the Real World

Angtian Wang	Johns Hopkins University, USA
Yutong Bai	Johns Hopkins University, USA
Adam Kortylewski	Max Planck Institute for Informatics, Germany
Cihang Xie	University of California, Santa Cruz, USA
Alan Yuille	Johns Hopkins University, USA
Xinyun Chen	University of California, Berkeley, USA
Judy Hoffman	Georgia Institute of Technology, USA
Wieland Brendel	University of Tübingen, Germany
Matthias Hein	University of Tübingen, Germany
Hang Su	Tsinghua University, China
Dawn Song	University of California, Berkeley, USA
Jun Zhu	Tsinghua University, China
Philippe Burlina	Johns Hopkins University, USA
Rama Chellappa	Johns Hopkins University, USA
Yinpeng Dong	Tsinghua University, China
Yingwei Li	Johns Hopkins University, USA
Ju He	Johns Hopkins University, USA
Alexander Robey	University of Pennsylvania, USA

W04 - Autonomous Vehicle Vision

Rui Fan	Tongji University, China
Nemanja Djuric	Aurora Innovation, USA
Wenshuo Wang	McGill University, Canada
Peter Ondruska	Toyota Woven Planet, UK
Jie Li	Toyota Research Institute, USA

W05 - Learning With Limited and Imperfect Data

Noel C. F. Codella	Microsoft, USA
Zsolt Kira	Georgia Institute of Technology, USA
Shuai Zheng	Cruise LLC, USA
Judy Hoffman	Georgia Institute of Technology, USA
Tatiana Tommasi	Politecnico di Torino, Italy
Xiaojuan Qi	The University of Hong Kong, China
Sadeep Jayasumana	University of Oxford, UK
Viraj Prabhu	Georgia Institute of Technology, USA
Yunhui Guo	University of Texas at Dallas, USA
Ming-Ming Cheng	Nankai University, China

W06 - Advances in Image Manipulation

Radu Timofte	University of Würzburg, Germany, and ETH Zurich, Switzerland
Andrey Ignatov	AI Benchmark and ETH Zurich, Switzerland
Ren Yang	ETH Zurich, Switzerland
Marcos V. Conde	University of Würzburg, Germany
Furkan Kınlı	Özyeğin University, Turkey

W07 - Medical Computer Vision

Tal Arbel	McGill University, Canada
Ayelet Akselrod-Ballin	Reichman University, Israel
Vasileios Belagiannis	Otto von Guericke University, Germany
Qi Dou	The Chinese University of Hong Kong, China
Moti Freiman	Technion, Israel
Nicolas Padoy	University of Strasbourg, France
Tammy Riklin Raviv	Ben Gurion University, Israel
Mathias Unberath	Johns Hopkins University, USA
Yuyin Zhou	University of California, Santa Cruz, USA

W08 - Computer Vision for Metaverse

Bichen Wu	Meta Reality Labs, USA
Peizhao Zhang	Facebook, USA
Xiaoliang Dai	Facebook, USA
Tao Xu	Facebook, USA
Hang Zhang	Meta, USA
Péter Vajda	Facebook, USA
Fernando de la Torre	Carnegie Mellon University, USA
Angela Dai	Technical University of Munich, Germany
Bryan Catanzaro	NVIDIA, USA

W09 - Self-Supervised Learning: What Is Next?

Yuki M. Asano	University of Amsterdam, The Netherlands
Christian Rupprecht	University of Oxford, UK
Diane Larlus	Naver Labs Europe, France
Andrew Zisserman	University of Oxford, UK

W10 - Self-Supervised Learning for Next-Generation Industry-Level Autonomous Driving

Xiaodan Liang	Sun Yat-sen University, China
Hang Xu	Huawei Noah's Ark Lab, China

Fisher Yu	ETH Zürich, Switzerland
Wei Zhang	Huawei Noah's Ark Lab, China
Michael C. Kampffmeyer	UiT The Arctic University of Norway, Norway
Ping Luo	The University of Hong Kong, China

W11 - ISIC Skin Image Analysis

M. Emre Celebi	University of Central Arkansas, USA
Catarina Barata	Instituto Superior Técnico, Portugal
Allan Halpern	Memorial Sloan Kettering Cancer Center, USA
Philipp Tschandl	Medical University of Vienna, Austria
Marc Combalia	Hospital Clínic of Barcelona, Spain
Yuan Liu	Google Health, USA

W12 - Cross-Modal Human-Robot Interaction

Fengda Zhu	Monash University, Australia
Yi Zhu	Huawei Noah's Ark Lab, China
Xiaodan Liang	Sun Yat-sen University, China
Liwei Wang	The Chinese University of Hong Kong, China
Xiaojun Chang	University of Technology Sydney, Australia
Nicu Sebe	University of Trento, Italy

W13 - Text in Everything

Ron Litman	Amazon AI Labs, Israel
Aviad Aberdam	Amazon AI Labs, Israel
Shai Mazor	Amazon AI Labs, Israel
Hadar Averbuch-Elor	Cornell University, USA
Dimosthenis Karatzas	Universitat Autònoma de Barcelona, Spain
R. Manmatha	Amazon AI Labs, USA

W14 - BioImage Computing

Jan Funke	HHMI Janelia Research Campus, USA
Alexander Krull	University of Birmingham, UK
Dagmar Kainmueller	Max Delbrück Center, Germany
Florian Jug	Human Technopole, Italy
Anna Kreshuk	EMBL-European Bioinformatics Institute, Germany
Martin Weigert	École Polytechnique Fédérale de Lausanne (EPFL), Switzerland
Virginie Uhlmann	EMBL-European Bioinformatics Institute, UK

Peter Bajcsy National Institute of Standards and Technology,
USA
Erik Meijering University of New South Wales, Australia

W15 - Visual Object-Oriented Learning Meets Interaction: Discovery, Representations, and Applications

Kaichun Mo Stanford University, USA
Yanchao Yang Stanford University, USA
Jiayuan Gu University of California, San Diego, USA
Shubham Tulsiani Carnegie Mellon University, USA
Hongjing Lu University of California, Los Angeles, USA
Leonidas Guibas Stanford University, USA

W16 - AI for Creative Video Editing and Understanding

Fabian Caba Adobe Research, USA
Anyi Rao The Chinese University of Hong Kong, China
Alejandro Pardo King Abdullah University of Science and
Technology, Saudi Arabia
Linning Xu The Chinese University of Hong Kong, China
Yu Xiong The Chinese University of Hong Kong, China
Victor A. Escorcia Samsung AI Center, UK
Ali Thabet Reality Labs at Meta, USA
Dong Liu Netflix Research, USA
Dahua Lin The Chinese University of Hong Kong, China
Bernard Ghanem King Abdullah University of Science and
Technology, Saudi Arabia

W17 - Visual Inductive Priors for Data-Efficient Deep Learning

Jan C. van Gemert Delft University of Technology, The Netherlands
Nergis Tömen Delft University of Technology, The Netherlands
Ekin Dogus Cubuk Google Brain, USA
Robert-Jan Bruintjes Delft University of Technology, The Netherlands
Attila Lengyel Delft University of Technology, The Netherlands
Osman Semih Kayhan Bosch Security Systems, The Netherlands
Marcos Baptista Ríos Alice Biometrics, Spain
Lorenzo Brigato Sapienza University of Rome, Italy

W18 - Mobile Intelligent Photography and Imaging

Chongyi Li Nanyang Technological University, Singapore
Shangchen Zhou Nanyang Technological University, Singapore

Ruicheng Feng	Nanyang Technological University, Singapore
Jun Jiang	SenseBrain Research, USA
Wenxiu Sun	SenseTime Group Limited, China
Chen Change Loy	Nanyang Technological University, Singapore
Jinwei Gu	SenseBrain Research, USA

W19 - People Analysis: From Face, Body and Fashion to 3D Virtual Avatars

Alberto Del Bimbo	University of Florence, Italy
Mohamed Daoudi	IMT Nord Europe, France
Roberto Vezzani	University of Modena and Reggio Emilia, Italy
Xavier Alameda-Pineda	Inria Grenoble, France
Marcella Cornia	University of Modena and Reggio Emilia, Italy
Guido Borghi	University of Bologna, Italy
Claudio Ferrari	University of Parma, Italy
Federico Becattini	University of Florence, Italy
Andrea Pilzer	NVIDIA AI Technology Center, Italy
Zhiwen Chen	Alibaba Group, China
Xiangyu Zhu	Chinese Academy of Sciences, China
Ye Pan	Shanghai Jiao Tong University, China
Xiaoming Liu	Michigan State University, USA

W20 - Safe Artificial Intelligence for Automated Driving

Timo Saemann	Valeo, Germany
Oliver Wasenmüller	Hochschule Mannheim, Germany
MarkusENZweiler	Esslingen University of Applied Sciences, Germany
Peter Schlicht	CARIAD, Germany
Joachim Sicking	Fraunhofer IAIS, Germany
Stefan Milz	Spleenlab.ai and Technische Universität Ilmenau, Germany
Fabian Hüger	Volkswagen Group Research, Germany
Seyed Ghobadi	University of Applied Sciences Mittelhessen, Germany
Ruby Moritz	Volkswagen Group Research, Germany
Oliver Grau	Intel Labs, Germany
Frédéric Blank	Bosch, Germany
Thomas Stauner	BMW Group, Germany

W21 - Real-World Surveillance: Applications and Challenges

Kamal Nasrollahi	Aalborg University, Denmark
Sergio Escalera	Universitat Autònoma de Barcelona, Spain

Radu Tudor Ionescu	University of Bucharest, Romania
Fahad Shahbaz Khan	Mohamed bin Zayed University of Artificial Intelligence, United Arab Emirates
Thomas B. Moeslund	Aalborg University, Denmark
Anthony Hoogs	Kitware, USA
Shmuel Peleg	The Hebrew University, Israel
Mubarak Shah	University of Central Florida, USA

W22 - Affective Behavior Analysis In-the-Wild

Dimitrios Kollias	Queen Mary University of London, UK
Stefanos Zafeiriou	Imperial College London, UK
Elnar Hajiyev	Realeyes, UK
Viktoriia Sharmanska	University of Sussex, UK

W23 - Visual Perception for Navigation in Human Environments: The JackRabbit Human Body Pose Dataset and Benchmark

Hamid Rezatofghi	Monash University, Australia
Edward Vendrow	Stanford University, USA
Ian Reid	University of Adelaide, Australia
Silvio Savarese	Stanford University, USA

W24 - Distributed Smart Cameras

Niki Martinel	University of Udine, Italy
Ehsan Adeli	Stanford University, USA
Rita Pucci	University of Udine, Italy
Animashree Anandkumar	Caltech and NVIDIA, USA
Caifeng Shan	Shandong University of Science and Technology, China
Yue Gao	Tsinghua University, China
Christian Micheloni	University of Udine, Italy
Hamid Aghajan	Ghent University, Belgium
Li Fei-Fei	Stanford University, USA

W25 - Causality in Vision

Yulei Niu	Columbia University, USA
Hanwang Zhang	Nanyang Technological University, Singapore
Peng Cui	Tsinghua University, China
Song-Chun Zhu	University of California, Los Angeles, USA
Qianru Sun	Singapore Management University, Singapore
Mike Zheng Shou	National University of Singapore, Singapore
Kaihua Tang	Nanyang Technological University, Singapore

W26 - In-Vehicle Sensing and Monitorization

Jaime S. Cardoso	INESC TEC and Universidade do Porto, Portugal
Pedro M. Carvalho	INESC TEC and Polytechnic of Porto, Portugal
João Ribeiro Pinto	Bosch Car Multimedia and Universidade do Porto, Portugal
Paula Viana	INESC TEC and Polytechnic of Porto, Portugal
Christer Ahlström	Swedish National Road and Transport Research Institute, Sweden
Carolina Pinto	Bosch Car Multimedia, Portugal

W27 - Assistive Computer Vision and Robotics

Marco Leo	National Research Council of Italy, Italy
Giovanni Maria Farinella	University of Catania, Italy
Antonino Furnari	University of Catania, Italy
Mohan Trivedi	University of California, San Diego, USA
Gérard Medioni	Amazon, USA

W28 - Computational Aspects of Deep Learning

Iuri Frosio	NVIDIA, Italy
Sophia Shao	University of California, Berkeley, USA
Lorenzo Baraldi	University of Modena and Reggio Emilia, Italy
Claudio Baccchi	University of Florence, Italy
Frederic Pariente	NVIDIA, France
Giuseppe Fiameni	NVIDIA, Italy

W29 - Computer Vision for Civil and Infrastructure Engineering

Joakim Bruslund Haurum	Aalborg University, Denmark
Mingzhu Wang	Loughborough University, UK
Ajmal Mian	University of Western Australia, Australia
Thomas B. Moeslund	Aalborg University, Denmark

W30 - AI-Enabled Medical Image Analysis: Digital Pathology and Radiology/COVID-19

Jaime S. Cardoso	INESC TEC and Universidade do Porto, Portugal
Stefanos Kollias	National Technical University of Athens, Greece
Sara P. Oliveira	INESC TEC, Portugal
Mattias Rantalainen	Karolinska Institutet, Sweden
Jeroen van der Laak	Radboud University Medical Center, The Netherlands
Cameron Po-Hsuan Chen	Google Health, USA

Diana Felizardo	IMP Diagnostics, Portugal
Ana Monteiro	IMP Diagnostics, Portugal
Isabel M. Pinto	IMP Diagnostics, Portugal
Pedro C. Neto	INESC TEC, Portugal
Xujiong Ye	University of Lincoln, UK
Luc Bidaut	University of Lincoln, UK
Francesco Rundo	STMicroelectronics, Italy
Dimitrios Kollias	Queen Mary University of London, UK
Giuseppe Banna	Portsmouth Hospitals University, UK

W31 - Compositional and Multimodal Perception

Kazuki Kozuka	Panasonic Corporation, Japan
Zelun Luo	Stanford University, USA
Ehsan Adeli	Stanford University, USA
Ranjay Krishna	University of Washington, USA
Juan Carlos Niebles	Salesforce and Stanford University, USA
Li Fei-Fei	Stanford University, USA

W32 - Uncertainty Quantification for Computer Vision

Andrea Pilzer	NVIDIA, Italy
Martin Trapp	Aalto University, Finland
Arno Solin	Aalto University, Finland
Yingzhen Li	Imperial College London, UK
Neill D. F. Campbell	University of Bath, UK

W33 - Recovering 6D Object Pose

Martin Sundermeyer	DLR German Aerospace Center, Germany
Tomáš Hodaň	Reality Labs at Meta, USA
Yann Labbé	Inria Paris, France
Gu Wang	Tsinghua University, China
Lingni Ma	Reality Labs at Meta, USA
Eric Brachmann	Niantic, Germany
Bertram Drost	MVTec, Germany
Sindi Shkodrani	Reality Labs at Meta, USA
Rigas Kouskouridas	Scape Technologies, UK
Ales Leonardis	University of Birmingham, UK
Carsten Steger	Technical University of Munich and MVTec, Germany
Vincent Lepetit	École des Ponts ParisTech, France, and TU Graz, Austria
Jiří Matas	Czech Technical University in Prague, Czech Republic

W34 - Drawings and Abstract Imagery: Representation and Analysis

Diane Oyen	Los Alamos National Laboratory, USA
Kushal Kafle	Adobe Research, USA
Michal Kucer	Los Alamos National Laboratory, USA
Pradyumna Reddy	University College London, UK
Cory Scott	University of California, Irvine, USA

W35 - Sign Language Understanding

Liliane Momeni	University of Oxford, UK
Gül Varol	École des Ponts ParisTech, France
Hannah Bull	University of Paris-Saclay, France
Prajwal K. R.	University of Oxford, UK
Neil Fox	University College London, UK
Ben Saunders	University of Surrey, UK
Necati Cihan Camgöz	Meta Reality Labs, Switzerland
Richard Bowden	University of Surrey, UK
Andrew Zisserman	University of Oxford, UK
Bencie Woll	University College London, UK
Sergio Escalera	Universitat Autònoma de Barcelona, Spain
Jose L. Alba-Castro	Universidade de Vigo, Spain
Thomas B. Moeslund	Aalborg University, Denmark
Julio C. S. Jacques Junior	Universitat Autònoma de Barcelona, Spain
Manuel Vázquez Enríquez	Universidade de Vigo, Spain

W36 - A Challenge for Out-of-Distribution Generalization in Computer Vision

Adam Kortylewski	Max Planck Institute for Informatics, Germany
Bingchen Zhao	University of Edinburgh, UK
Jiahao Wang	Max Planck Institute for Informatics, Germany
Shaozuo Yu	The Chinese University of Hong Kong, China
Siwei Yang	Hong Kong University of Science and Technology, China
Dan Hendrycks	University of California, Berkeley, USA
Oliver Zendel	Austrian Institute of Technology, Austria
Dawn Song	University of California, Berkeley, USA
Alan Yuille	Johns Hopkins University, USA

W37 - Vision With Biased or Scarce Data

Kuan-Chuan Peng	Mitsubishi Electric Research Labs, USA
Ziyang Wu	United Imaging Intelligence, USA

W38 - Visual Object Tracking Challenge

Matej Kristan	University of Ljubljana, Slovenia
Aleš Leonardis	University of Birmingham, UK
Jiří Matas	Czech Technical University in Prague, Czech Republic
Hyung Jin Chang	University of Birmingham, UK
Joni-Kristian Kämäräinen	Tampere University, Finland
Roman Pflugfelder	Technical University of Munich, Germany, Technion, Israel, and Austrian Institute of Technology, Austria
Luka Čehovin Zajc	University of Ljubljana, Slovenia
Alan Lukežič	University of Ljubljana, Slovenia
Gustavo Fernández	Austrian Institute of Technology, Austria
Michael Felsberg	Linköping University, Sweden
Martin Danelljan	ETH Zurich, Switzerland

Contents – Part VII

W28 - Computational Aspects of Deep Learning

EdgeNeXt: Efficiently Amalgamated CNN-Transformer Architecture for Mobile Vision Applications	3
<i>Muhammad Maaz, Abdelrahman Shaker, Hisham Cholakkal, Salman Khan, Syed Waqas Zamir, Rao Muhammad Anwer, and Fahad Shahbaz Khan</i>	
Continual Inference: A Library for Efficient Online Inference with Deep Neural Networks in PyTorch	21
<i>Lukas Hedegaard and Alexandros Iosifidis</i>	
Hydra Attention: Efficient Attention with Many Heads	35
<i>Daniel Bolya, Cheng-Yang Fu, Xiaoliang Dai, Peizhao Zhang, and Judy Hoffman</i>	
BiTAT: Neural Network Binarization with Task-Dependent Aggregated Transformation	50
<i>Geon Park, Jaehong Yoon, Haiyang Zhang, Xing Zhang, Sung Ju Hwang, and Yonina C. Eldar</i>	
Power Awareness in Low Precision Neural Networks	67
<i>Nurit Spingarn Eliezer, Ron Banner, Hilla Ben-Yaakov, Elad Hoffer, and Tomer Michaeli</i>	
Augmenting Legacy Networks for Flexible Inference	84
<i>Jason Clemons, Iuri Frosio, Maying Shen, Jose M. Alvarez, and Stephen Keckler</i>	
Deep Neural Network Compression for Image Inpainting	99
<i>Soyeong Kim, Do-Yeon Kim, and Jaekyun Moon</i>	
QFT: Post-training Quantization via Fast Joint Finetuning of All Degrees of Freedom	115
<i>Alex Finkelstein, Ella Fuchs, Idan Tal, Mark Grobman, Niv Vosco, and Eldad Meller</i>	
Searching for N:M Fine-grained Sparsity of Weights and Activations in Neural Networks	130
<i>Ruth Akiva-Hochman, Shahaf E. Finder, Javier S. Turek, and Eran Treister</i>	

W29 - Computer Vision for Civil and Infrastructure Engineering

Image Illumination Enhancement for Construction Worker Pose Estimation in Low-light Conditions	147
<i>Xinyu Chen and Yantao Yu</i>	
Towards an Error-free Deep Occupancy Detector for Smart Camera Parking System	163
<i>Tung-Lam Duong, Van-Duc Le, Tien-Cuong Bui, and Hai-Thien To</i>	
CrackSeg9k: A Collection and Benchmark for Crack Segmentation Datasets and Frameworks	179
<i>Shreyas Kulkarni, Shreyas Singh, Dhananjay Balakrishnan, Siddharth Sharma, Saipraneeth Devunuri, and Sai Chowdeswara Rao Korlapati</i>	
PriSeg: IFC-Supported Primitive Instance Geometry Segmentation with Unsupervised Clustering	196
<i>Zhiqi Hu and Ioannis Brilakis</i>	
Depth Contrast: Self-supervised Pretraining on 3DPM Images for Mining Material Classification	212
<i>Prakash Chandra Chhipa, Richa Upadhyay, Rajkumar Saini, Lars Lindqvist, Richard Nordenskjold, Seiichi Uchida, and Marcus Liwicki</i>	
Facilitating Construction Scene Understanding Knowledge Sharing and Reuse via Lifelong Site Object Detection	228
<i>Ruoxin Xiong, Yuansheng Zhu, Yanyu Wang, Pengkun Liu, and Pingbo Tang</i>	
Model-Assisted Labeling via Explainability for Visual Inspection of Civil Infrastructures	244
<i>Klara Janouskova, Mattia Rigotti, Ioana Giurgiu, and Cristiano Malossi</i>	
A Hyperspectral and RGB Dataset for Building Façade Segmentation	258
<i>Nariman Habibi, Ernest Kwan, Weihao Li, Christfried Webers, Jeremy Oorloff, Mohammad Ali Armin, and Lars Petersson</i>	
Improving Object Detection in VHR Aerial Orthomosaics	268
<i>Tanguy Ophoff, Kristof Van Beeck, and Toon Goedemé</i>	
Active Learning for Imbalanced Civil Infrastructure Data	283
<i>Thomas Frick, Diego Antognini, Mattia Rigotti, Ioana Giurgiu, Benjamin Grewe, and Cristiano Malossi</i>	

UAV-Based Visual Remote Sensing for Automated Building Inspection	299
<i>Kushagra Srivastava, Dhruv Patel, Aditya Kumar Jha, Mohhit Kumar Jha, Jaskirat Singh, Ravi Kiran Sarvadevabhatla, Pradeep Kumar Ramancharla, Harikumar Kandath, and K. Madhava Krishna</i>	
ConSLAM: Periodically Collected Real-World Construction Dataset for SLAM and Progress Monitoring	317
<i>Maciej Trzeciak, Kacper Pluta, Yasmin Fathy, Lucio Alcalde, Stanley Chee, Antony Bromley, Ioannis Brilakis, and Pierre Alliez</i>	
NeuralSI: Structural Parameter Identification in Nonlinear Dynamical Systems	332
<i>Xuyang Li, Hamed Bolandi, Talal Salem, Nizar Lajnef, and Vishnu Naresh Boddeti</i>	
A Geometric-Relational Deep Learning Framework for BIM Object Classification	349
<i>Hairong Luo, Ge Gao, Han Huang, Ziyi Ke, Cheng Peng, and Ming Gu</i>	
Generating Construction Safety Observations via CLIP-Based Image-Language Embedding	366
<i>Wei Lun Tsai, Jacob J. Lin, and Shang-Hsien Hsieh</i>	
W30 - AI-Enabled Medical Image Analysis: Digital Pathology and Radiology/COVID-19	
Harmonization of Diffusion MRI Data Obtained with Multiple Head Coils Using Hybrid CNNs	385
<i>Leon Weninger, Sandro Romanzetti, Julia Ebert, Kathrin Reetz, and Dorit Merhof</i>	
CCRL: Contrastive Cell Representation Learning	397
<i>Ramin Nakhli, Amirali Darbandsari, Hossein Farahani, and Ali Bashashati</i>	
Automatic Grading of Cervical Biopsies by Combining Full and Self-supervision	408
<i>Mélanie Lubrano, Tristan Lazard, Guillaume Balezo, Yaëlle Bellahsen-Harrar, Cécile Badoual, Sylvain Berlemont, and Thomas Walter</i>	
When CNN Meet with ViT: Towards Semi-supervised Learning for Multi-class Medical Image Semantic Segmentation	424
<i>Ziyang Wang, Tianze Li, Jian-Qing Zheng, and Baoru Huang</i>	

Using Whole Slide Image Representations from Self-supervised Contrastive Learning for Melanoma Concordance Regression	442
<i>Sean Grullon, Vaughn Spurrier, Jiayi Zhao, Corey Chivers, Yang Jiang, Kiran Motaparthy, Jason Lee, Michael Bonham, and Julianna Ianni</i>	
Explainable Model for Localization of Spiculation in Lung Nodules	457
<i>Mirtha Lucas, Miguel Lerma, Jacob Furst, and Daniela Raicu</i>	
Self-supervised Pretraining for 2D Medical Image Segmentation	472
<i>András Kalapos and Bálint Gyires-Tóth</i>	
CMC_v2: Towards More Accurate COVID-19 Detection with Discriminative Video Priors	485
<i>Junlin Hou, Jilan Xu, Nan Zhang, Yi Wang, Yuejie Zhang, Xiaobo Zhang, and Rui Feng</i>	
COVID Detection and Severity Prediction with 3D-ConvNeXt and Custom Pretrainings	500
<i>Daniel Kienzle, Julian Lorenz, Robin Schön, Katja Ludwig, and Rainer Lienhart</i>	
Two-Stage COVID19 Classification Using BERT Features	517
<i>Weijun Tan, Qi Yao, and Jingfeng Liu</i>	
PVT-COV19D: COVID-19 Detection Through Medical Image Classification Based on Pyramid Vision Transformer	526
<i>Lilang Zheng, Jiaxuan Fang, Xiaorun Tang, Hanzhang Li, Jiaxin Fan, Tianyi Wang, Rui Zhou, and Zhaoyan Yan</i>	
Boosting COVID-19 Severity Detection with Infection-Aware Contrastive Mixup Classification	537
<i>Junlin Hou, Jilan Xu, Nan Zhang, Yuejie Zhang, Xiaobo Zhang, and Rui Feng</i>	
Variability Matters: Evaluating Inter-Rater Variability in Histopathology for Robust Cell Detection	552
<i>Cholmin Kang, Chunggi Lee, Heon Song, Minuk Ma, and Sérgio Pereira</i>	
FUSION: Fully Unsupervised Test-Time Stain Adaptation via Fused Normalization Statistics	566
<i>Nilanjan Chattopadhyay, Shiv Gehlot, and Nitin Singhal</i>	
Relieving Pixel-Wise Labeling Effort for Pathology Image Segmentation with Self-training	577
<i>Romain Mormont, Mehdi Testouri, Raphaël Marée, and Pierre Geurts</i>	

CNR-IEMN-CD and CNR-IEMN-CSD Approaches for Covid-19 Detection and Covid-19 Severity Detection from 3D CT-scans	593
<i>Fares Bougourzi, Cosimo Distante, Fadi Dornaika, and Abdelmalik Taleb-Ahmed</i>	
Representation Learning with Information Theory to Detect COVID-19 and Its Severity	605
<i>Abel Díaz Berenguer, Tanmoy Mukherjee, Yifei Da, Matías Nicolás Bossa, Maryna Kvasnytsia, Jef Vandemeulebroucke, Nikos Deligiannis, and Hichem Sahli</i>	
Spatial-Slice Feature Learning Using Visual Transformer and Essential Slices Selection Module for COVID-19 Detection of CT Scans in the Wild	621
<i>Chih-Chung Hsu, Chi-Han Tsai, Guan-Lin Chen, Sin-Di Ma, and Shen-Chieh Tai</i>	
Multi-scale Attention-Based Multiple Instance Learning for Classification of Multi-gigapixel Histology Images	635
<i>Made Satria Wibawa, Kwok-Wai Lo, Lawrence S. Young, and Nasir Rajpoot</i>	
A Deep Wavelet Network for High-Resolution Microscopy Hyperspectral Image Reconstruction	648
<i>Qian Wang and Zhao Chen</i>	
Using a 3D ResNet for Detecting the Presence and Severity of COVID-19 from CT Scans	663
<i>Robert Turnbull</i>	
AI-MIA: COVID-19 Detection and Severity Analysis Through Medical Imaging	677
<i>Dimitrios Kollias, Anastasios Arsenos, and Stefanos Kollias</i>	
Medical Image Segmentation: A Review of Modern Architectures	691
<i>Natalia Salpea, Paraskevi Tzouveli, and Dimitrios Kollias</i>	
Medical Image Super Resolution by Preserving Interpretable and Disentangled Features	709
<i>Dwarikanath Mahapatra, Behzad Bozorgtabar, and Mauricio Reyes</i>	
Multi-label Attention Map Assisted Deep Feature Learning for Medical Image Classification	722
<i>Dwarikanath Mahapatra and Mauricio Reyes</i>	

Unsupervised Domain Adaptation Using Feature Disentanglement and GCNs for Medical Image Classification	735
<i>Dwarikanath Mahapatra, Steven Korevaar, Behzad Bozorgtabar, and Ruwan Tennakoon</i>	
Author Index	749