

Markus Seidl, Matthias Zeppelzauer, and Peter M. Roth (eds.)

**Proceedings of the
OAGM Workshop 2021**

**Computer Vision and Pattern Analysis Across
Domains**

November 24–25, 2021

University of Applied Sciences St. Pölten

Austrian Association of Pattern Recognition (OAGM)

Editors

Markus Seidl, Matthias Zeppelzauer, and Peter M. Roth

Layout

Austrian Association of Pattern Recognition
<https://aapr.at/>

Cover

Verlag der Technischen Universität Graz

Supported by



© 2022 Verlag der Technischen Universität Graz
www.tugraz-verlag.at

ISBN 978-3-85125-869-1
DOI 10.3217/978-3-85125-869-1



<https://creativecommons.org/licenses/by/4.0/deed.en>

Contents

Preface	iii
Program Committee	v
Awards 2020	vi
Index of Authors	vii
Evaluation of Monocular and Stereo Depth Data for Geometry-Assisted Learning of 3D Pose <i>Andreas Kriegler, Csaba Beleznai, and Margrit Gelautz</i>	1
An Evaluation of the Machine Readability of Traffic Sign Pictograms using Synthetic Data Sets <i>Alexander Maletzky, Stefan Thumfart, and Christoph Wruß</i>	8
Efficient Instance Segmentation of Panoramic Images of Indoor Scenes <i>Werner Bailer and Hannes Fassold</i>	15
High-Speed Stereoscopic Fragment Tracking in Industrial Filter Cleaning <i>Friedrich Holzinger, Michael Schneeberger, Manfred Klopschitz, Martina Uray, Matthias R��ther, and Gernot Krammer</i>	20
Enabling Classification of Heavily-occluded Objects through Class-agnostic Image Manipulation <i>Benjamin Gallauner, Stefan Thalhammer, and Markus Vincze</i>	26
Real Estate Attribute Prediction from Multiple Visual Modalities and Missing Data <i>Eric Stumpe, Miroslav Despotovic, Zedong Zhang, and Matthias Zeppelzauer</i>	31
A study on robust feature representations for grain density estimates in austenitic steel <i>Filip Ilic, Marc Masana, Lea Bogensperger, Harald Ganster, and Thomas Pock</i>	38
On the Influence of Beta Cell Granule Counting for Classification in Type 1 Diabetes <i>Lea Bogensperger, Marc Masana, Filip Ilic, Dagmar Kolb, Thomas R. Pieber, and Thomas Pock</i>	45
Computed Tomography Reconstruction Using Generative Energy-Based Priors <i>Martin Zach, Erich Kobler, and Thomas Pock</i>	51

SliTraNet: Automatic Detection of Slide Transitions in Lecture Videos using Convolutional Neural Networks <i>Aline Sindel, Abner Hernandez, Seung Hee Yang, Vincent Christlein, and Andreas Maier</i>	58
Data Synthesis for Large-scale Supermarket Product Recognition <i>Julian Strohmayer and Martin Kampel</i>	64
Benign Object Detection and Distractor Removal in 2D Baggage Scans <i>Anna Sebernegg and Walter G. Kropatsch</i>	67
Explaining YOLO: Leveraging Grad-CAM to Explain Object Detections <i>Armin Kirchknopf, Djordje Slijepcevic, Ilkay Wunderlich, Michael Breiter, Johannes Traxler, and Matthias Zeppelzauer</i>	70
Case Study: Ensemble Decision-Based Annotation of Unconstrained Real Estate Images <i>Miroslav Despotovic, Zedong Zhang, Eric Stumpe, and Matthias Zeppelzauer</i>	73
Human Tracking and Pose Estimation for Subsurface Operations <i>Roland Perko, Hannes Fassold, Alexander Almer, Robert Wenighofer, and Peter Hofer</i>	76
Multi-Spectral Segmentation with Synthesized Data for Refuse Sorting <i>Harald Ganster, Alfred Rinnhofer, Georg Waltner, Christian Payer, Heimo Gursch, Christian Oberwinkler, Reinhard Meisenbichler, and Horst Bischof</i>	79

Preface

When we discussed the date for the 2021 edition of the OAGM workshop, we already had the re-scheduling and finally cancellation of the 2020 edition in our minds. At the time of our discussion the shortage of COVID-19 vaccines was the dominant topic. Hence, when the decision between September and November was due, we decided that the workshop should take place on November 24 and 25, 2021 at University of Applied Sciences St. Pölten. Looking back, September would have allowed to hold the workshop as intended, namely To bring together researchers, students, professionals, and practitioners from the fields of Computer Vision and Pattern Recognition to present and actively discuss the latest research and developments.

Given the fast development of the pandemic situation, we had to cancel the workshop at the beginning of November. At this time, the review process was already finished. Consequently, it is possible to publish the conference proceedings. We thank the authors and reviewers for their contributions to this publication.

We received 21 original contributions of which 16 (10/12 full papers, 3/3 student papers, 3/6 spotlight papers) have been accepted, resulting in an overall acceptance rate of 76%. Each contribution was peer-reviewed in a double-blind process by at least two reviewers from an international program committee. One outstanding contribution will be awarded a best paper prize sponsored by OCG. In addition, there will be an IEEE Women in Engineering Award for the best contribution of a female first author. We want to thank OCG and IEEE for sponsoring these awards and Land Niederösterreich for the financial support of the unfortunately cancelled workshop and this publication. At the time of its cancellation, the workshop program was already planned. We thank the invited speakers Andreas Maier (FAU Erlangen-Nürnberg), Marc Pollefeys (ETH Zürich) and Markus Schedl (JKU Linz) for their willingness to give a presentation.

We hope to see you in 2022 at the next edition of the OAGM workshop, stay healthy,

Markus Seidl and Matthias Zeppelzauer (conference chairs)
Peter M. Roth (publication chair)
St. Pölten, December 2022

Workshop Chairs

Markus Seidl (FH St. Pölten)

Matthias Zeppelzauer (FH St. Pölten)

Publication Chair

Peter M. Roth (Technical University of Munich)

Program Committee

Alexander Schindler (Austrian Institute of Technology)
Andreas Uhl (University of Salzburg)
Arjan Kuijper (TU Darmstadt)
Armin Kirchknopf (St. Pölten University of Applied Sciences)
Christoph H. Lampert (IST Austria)
Csaba Beleznai (Austrian Institute of Technology, Austria)
Djordje Slijepcevic (St. Pölten University of Applied Sciences)
Florian Kleber (TU Wien)
Friedrich Fraundorfer (Graz University of Technology)
Gerhard Paar (Joanneum Research)
Gernot Stübl (PROFACTOR GmbH)
Gwenael Mercier (University of Vienna)
Harald Ganster (Joanneum Research)
Horst Bischof (Graz University of Technology)
Isabel Dregely (FH Technikum Wien)
Johannes Fürnkranz (JKU Linz)
Josef Scharinger (JKU Linz)
Levente Hajder (Eötvös Loránd University)
Margrit Gelautz (TU Wien)
Martin Kampel (TU Wien)
Martin Welk (UMIT Hall/Tyrol)
Mathias Lux (University of Klagenfurt)
Michael Bleyer (Microsoft)
Peter M. Roth (Graz University of Technology)
Robert Sablatnig (TU Wien)
Roland Perko (Joanneum Research)
Thomas Pock (Graz University of Technology)
Vincent Lepetit (ENPC ParisTech)
Walter G. Kropatsch (TU Wien)

OAGM Awards 2020

The

OAGM Best Paper Prize 2020

were awarded to the papers

Highly Accurate Binary Image Segmentation for Cars

by

Thomas Heitzinger and Martin Kampel.

and

Real-World Video Restoration using Noise2Noise

by

Martin Zach and Erich Kobler.

Index of authors

- Almer, Alexander, 76
- Bailer, Werner, 15
- Beleznai, Csaba, 1
- Bischof, Horst, 79
- Bogensperger, Lea, 38, 45
- Breiter, Michael, 70
- Christlein, Vincent, 58
- Despotovic, Miroslav, 31, 73
- Fassold, Hannes, 15, 76
- Gallauner, Benjamin, 26
- Ganster, Harald, 38, 79
- Gelautz, Margrit, 1
- Gursch, Heimo, 79
- Hernandez, Abner, 58
- Hofer, Peter, 76
- Holzinger, Friedrich, 20
- Ilic, Filip, 38, 45
- Kampel, Martin, 64
- Kirchknopf, Armin, 70
- Klopschitz, Manfred, 20
- Kobler, Erich, 51
- Kolb, Dagmar, 45
- Krammer, Gernot, 20
- Kriegler, Andreas, 1
- Kropatsch, Walter G., 67
- Maier, Andreas, 58
- Maletzky, Alexander, 8
- Masana, Marc, 38, 45
- Meisenbichler, Reinhard, 79
- Oberwinkler, Christian, 79
- Payer, Christian, 79
- Perko, Roland, 76
- Pieber, Thomas R., 45
- Pock, Thomas, 38, 45, 51
- Rinnhofer, Alfred, 79
- Rüther, Matthias, 20
- Schneeberger, Michael, 20
- Sebernegg, Anna, 67
- Sindel, Aline, 58
- Slijepcevic, Djordje, 70
- Strohmayr, Julian, 64
- Stumpe, Eric, 31, 73
- Thalhammer, Stefan, 26
- Thumfart, Stefan, 8
- Traxler, Johannes, 70
- Uray, Martina, 20
- Vincze, Markus, 26
- Waltner, Georg, 79
- Wenighofer, Robert, 76
- Wruß, Christoph, 8
- Wunderlich, Ilkay, 70
- Yang, Seung Hee, 58
- Zach, Martin, 51
- Zeppelzauer, Matthias, 31, 70, 73
- Zhang, Zedong, 31, 73