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Andreas Pichler, Peter M. Roth, Robert Sablatnig, Gernot Stübl,
and Markus Vincze (eds.)

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Austrian Association of Pattern Recognition (OAGM)
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Editors

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Preface

The ARW and OAGM Workshop on "Vision and Robotics" is organized this year by Profactor in the beautiful city of Steyr. The main intention is to bring together researchers, students, professionals, and practitioners from the fields of Computer Vision and Robotics to present and actively discuss latest research and developments. While in the past there has been a perceivable gap between these two research directions, one may note that the borders get more and more blurred. During the preparation of the workshop this observation was underpinned by interesting contributions addressing both scientific communities. From over 50 submissions, an international program committee selected 48 for the presentation at the workshop. Based on the decisions, we could assemble an interesting and lively program with 30 talks and 18 posters both in plenum and parallel sessions. During the joint workshop, outstanding contributions will be awarded with prices sponsored by OAGM and IEEE RAS. We are also very proud that four invited international established researchers support the event: Jiří Matas (Czech Technical University of Prague), Manfred Tscheligi (Austrian Institute of Technology & University of Alin Albu-Schäffer (German Aerospace Center).

We wish an interesting and fruitful event,

Andreas Pichler, Markus Vincze (ARW Chairs)

Gernot Stübl, Robert Sablatnig, Peter M. Roth (OAGM Chairs)

Steyr, May 2019

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Sebastian Zambal (PROFACTOR GmbH)

OAGM Award 2018

The

OCG Best Paper Award 2018

was awarded to the paper

Globally Consistent Dense Real-Time 3D Reconstruction from RGBD Data

by

Rafael Weilharter, Fabian Schenk, and Friedrich Fraundorfer.

ARW Awards 2018

The

IEEE RAS Austria Best Research Paper Award

was awarded to the paper

Analysis of Feature Tracking Methods for Vision-Based Vibration Damping of Flexible Link Robots

by

Florian Pucher, Hubert Gattringer, and Andreas Müller.

The

Best Student Paper

sponsored by the ABB-Group was awarded to the paper

Development of a 3D-Printed Bionic Hand with Muscle- and Force Control

by

Florian Dannereder, Paul Herwig Pachschwöll, Mohamed Aburaia, Erich Markl, Maximilian Lackner, and Corinna Engelhardt-Nowitzki.

The

Best Student Poster

sponsored by the ABB-Group was awarded to the paper

Extension of the Action Verb Corpus for Supervised Learning

by

Matthias Hirschmanner, Stephanie Gross, Brigitte Krenn, Friedrich Neubarth, Martin Trapp, Michael Zillich, Markus Vincze.

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Keynote Talks

Visual Tracking of Fast Moving Objects

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Abstract
Visual tracking is a classical computer vision problem with many applications. I will first overview the diverse setting in which it has been studied: single view vs. multi-camera, color or intensity vs. RGBD, short-term vs. long-term, with vs. without a prior model of the tracked object. Next, I will discuss the state-of-the-art and the influence of the "CNN revolution" on the field. In the second part of the talk I will present a method for tracking of objects that move fast with respect to camera, at a speed that makes them appear as blurred streaks. Tracking of such object requires inversion of the image formation that involves a blurring and matting process. We will show that the presented method recovers the inter- and intra-frame trajectory in an interesting class of cases.

Automation Experience: An Experience Centered View Into Automated Contexts

Sebastian Egger-Lampl

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Abstract
User Experience is an omnipresent qualitative issue in almost all application contexts. More and more this is and has to be tackled as key ingredient of technological developments. The presentation will deliver a comprehensive view into the diverse facets of user experience, both from research as well as an industrial perspective. What automated contexts inhabited by the co-existence of autonomous artifacts could gain from a wider experience perspective? This includes the discussion of (future) relevant experience qualities (e.g. an interaction material view on interaction) as well the relevance of a wider over time-considerations of experience with automated systems. An example of quantitative analysis of human-to-human interaction and its transferability to human-machine interaction paradigms will depict the potential of novel experience approaches for human-machine collaboration. Furthermore, the presentation will also introduce a wider view on technology including acceptance as another success parameter.

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Computer Vision for Complex Activities

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Abstract
Understanding complex human activities is a requirement for efficient human-robot interaction as well as several other tasks in a production environment. This talk will highlight challenges that arise when analyzing complex human activities (eg., assembly tasks) with a computer vision system. We will demonstrate our recent work in that area and describe some of the major research challenges, including training these systems with minimal supervision, representations of complex activities etc.

Multi-contact Control and Locomotion with Torque Controlled Humanoids

Christian Ott

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Abstract
During the last ten years several new humanoid robots have been presented, which allow for joint torque control as an alternative to classical position control. The low level torque interfaces in these robots are used for implementing force based control approaches, like whole-body impedance and compliance control. Recently, considerable progress has also been made in torque based walking on rough terrain. In this talk I will give an overview of these developments and I will present some recent results made with the robot TORO at DLR in the context of the EU project COMANOID in which humanoid robots have been evaluated in an aircraft manufacturing task. Finally, I will give an outlook on the next generation of physically compliant humanoids and their control approaches.