CVWW 17

February 6 – 8, 2017
Hotel Althof Retz, Austria

Workshop Program

CVWW 17

22nd Computer Vision Winter Workshop

February 6 – 8, 2017
Hotel Althof Retz, Austria
http://cvww2017.prip.tuwien.ac.at/

organized by

Pattern Recognition and Image Processing Group & PRIP Club

Favoritenstraße 9 - 11, 186-3
1040 Wien
Austria

sponsored by

in cooperation with

Preface

The 22nd Computer Winter Workshop was organized by the PRIP Club and the PRIP Group at the Institute of Computer Graphics and Algorithms at TU Wien. It took place at Symposium Hotel Althof in Retz, Austria, from February 6th till February 8th, 2017.

The Computer Vision Winter Workshop (CVWW) is the annual meeting of several computer vision research groups located in Graz, Ljubljana, Prague, and Vienna. We want to communicate fresh ideas within the groups, and provide conference experience to students. However, the workshop is open to everyone.

26 papers have been submitted to the workshop. Each of them was reviewed by at least 3 members of the program committee. 25 papers have been accepted, where 17 are oral presentations and 8 are posters.

A “Best Paper Award” with the prize money of € 500 (in cooperation with the Austrian Computer Society, OCG) was handed over to the paper nominated based on the presentation during the workshop and the written paper in the proceedings. In addition, there was a “Best Reviewer Voting” for the first time in the history of CVWW. The result was a ranking of the members of the program committee, which should be updated and continued in future workshops.

The co-chairs of the workshop would like to thank the local organizing committee and the members of the program committee for their work, support and feedback.

Walter G. Kropatsch
Ines Janusch
Nicole M. Artner

CVWW co-chairs

Retz, February 2017

Committees

Co-Chairs

Walter G. Kropatsch
Ines Janusch
Nicole M. Artner

Program Committee

Majid Banaeyan
Csaba Beleznai
Horst Bischof
Wilhelm Burger
Jan Cech
Luka Čehovin
Ondrej Chum
Ondrej Drbohlav
Boris Flach
Vojtech Franc
Stefan Heber
Martin Hirzer
Vaclav Hlavac
Matej Kristan
Christoph Lampert
Vincent Lepetit
Roxane Licandro
Rok Mandeljc
Jiri Matas
Martin Matousek
Mirko Navara
Peter Peer
Janez Pers
Roman Pflugfelder
Axel Pinz
Thomas Pock
Daniel Prusa
Christian Reinbacher
Peter Roth
Matthias Rüther
Robert Sablatni
Alessia Saggese
Radim Sara
Alexander Shekhovtsov
Danijel Skoca
Darko Stern
Vitomir Struc
Tomas Svoboda
Martin Urschler
Mario Vento
Ivan Viola
Christoph Vogel
Tomas Vojir
Sebastian Zambanini

Local Organizing Committee

Walter G. Kropatsch
Ines Janusch
Nicole M. Artner
Anna Gostler
Daniel Pucher

Invited Speakers

Monday, February 6, 14:00

Mario Vento
University of Salerno, Italy

Are we ready to use graphs in Pattern Recognition?

Graphs are used in Pattern Recognition for representing objects of interest by means of parts suitably connected with each other. This kind of representation induces the need to formulate the main operations required in Pattern Recognition in terms of operations on graphs: classification, in terms of comparison between an object and a set of prototypes, and learning, which is the process for obtaining a model of a class starting from a set of known samples.

The advantage of using graphs over statistical approaches is related to the contextual use of information about the single parts of an object during the classification procedure; the matching is in fact carried out parts by parts and not in the whole and this property allows it to attribute at any single part the relevance it assumes in the specific comparison. Forty years have passed since the first papers on this topic appeared in the literature. A lot of research effort has been devoted to explore this challenging field and some approaches have been meanwhile consolidated.

The talk is organized as an introduction to the most relevant techniques proposed over these years, so as to give the audience an overview of the field. The presentation is aimed at revealing the rationale inspiring the papers published in these years, which is used as the basis for a coarse classification of the techniques. Particular attention is devoted to recent advances in exact graph matching algorithms, that are opening new scenarios in different fields requiring the matching of huge graphs, up to thousands of nodes.

Tuesday, February 7, 09:00

Wilhelm Burger
Upper Austria University of Applied Sciences, Austria

Computer Vision – Mission Accomplished or Punk?

This talk tries to review the current state of Computer Vision from a mostly non-technical perspective. Striking success in some highly visible application areas has shifted Computer Vision into the focus of modern industrial developments in recent years.

While such breakthroughs caught broad attention and well-deserved interest, the fact that this is the harvest of decades of intensive research in academia and industry, advanced concepts and a long evolutionary process is often overlooked by the public. It obscures the real situation as that we have only reached a solid starting point, that many difficult problems remain to be solved and development will continue to take time, financial and human resources, perhaps even more than has been invested so far. In other words, computer vision is not a simple, out-of-the-box technology yet, being neither easy nor universally applicable.

On the other hand, we observe a spreading misconception among decision makers in industry, politics and media that AI technology (and computer vision in particular) has matured to a point that, from now on, practically any smart and/or human-like task can be solved with ease. Moreover, newcomers like Google are trusted (and feared) by the public opinion to have a salvation message and solution to problems of arbitrary complexity. While this may be a bit reminiscent of the ‚steam punk‘ era, it bears the dangers of misguiding long-term decisions relevant to industrial strategy, research funding and education. It also raises the question about our own responsibilities as researchers and educators and what we can do (or rather not do) to communicate an appropriate and realistic picture of this field in the public.

Wednesday, February 8, 09:00

Ivan Viola
TU Wien, Austria

Multi-Scale Molecular Data Visualization

The study of biological processes carried out in living organisms is among the central foci of modern science. The field is nowadays by large extent computational, there are many kinds of digital models that characterize particular aspects of life.

To provide a comprehensive view on biological phenomena, visualization offers itself for integrating multiple models into one visual environment. One of the interesting challenges, associated with such a visual integration, is to communicate phenomena that are simultaneously described on several spatial and temporal scales.

In my talk we will discuss a variety of visualization techniques that bridge several orders of magnitude of spatial scale by interactively rendering structural information from a single atom level (10^{-10} m) up to the scale of entire viruses or bacteria with a complete molecular machinery (ca. 10^{-6} m). Integrative structural biology models are very dense and consist of many structures each of these serving a particular function. In order to convey such information clearly, I will discuss how visual abstractions help us to visualize multiple scales and how these techniques can be used to deal with the structural occlusion inherent in the integrative model. To convey a living structure, large structural models can be extended with dynamic biological models of physiology. In the last part of my talk I will discuss an integration of molecular reaction pathways with the structure. The reactions are modeled quantitatively, can be executed in run-time during interactive visualization to allow for interactive visual steering of the simulation parameters.

Workshop Program at a Glance

Monday, February 6	Tuesday, February 7	Wednesday, February 8
	09:00 Invited Talk **Wilhelm Burger** Computer Vision – Mission Accomplished or Punk?	09:00 Invited Talk **Ivan Viola** Multi-Scale Molecular Data Visualization
	10:00 Session 2 **Depth+Learning**	10:00 Session 6 **Optimization**
	10:50 Coffee Break	10:50 Coffee Break
11:30 – 13:30 Registration	11:15 Session 3 **Applications in Computer Vision**	11:15 Session 7 **Tracking**
12:30 Lunch	12:30 Lunch	12:30 Workshop Closing Best Paper Award
13:45 Opening		12:45 Lunch
14:00 Invited Talk **Mario Vento** Are we ready to use graphs in Pattern Recognition?	14:00 Session 4 **Posters**	
15:00 Coffee Break		
15:30 Session 1 **Machine Learning**	15:30 Coffee Break	
17:30 Social Event Retz Underground Tour	16:00 Session 5 **3D Vision + Robotics**	
19:00 Dinner	19:00 Dinner	

Workshop Program

Monday, February 6

11:30 – 13:30	Registration
12:30	Lunch
13:45	Opening
14:00	Invited talk Mario Vento Are we ready to use graphs in Pattern Recognition?
15:00	Coffee Break
	Session 1: Machine Learning Session chair: Jiri Matas
15:30	Unsupervised Learning for Image Category Detection Philipp Seeböck, René Donner and Georg Langs
15:55	End-to-End Training of Hybrid CNN-CRF Models for Semantic Segmentation using Structured Learning Aleksander Colovic, Patrick Knöbelreiter, Alexander Shekhovtsov and Thomas Pock
16:20	Loss-Specific Training of Random Forests for Super-Resolution Alexander Grabner, Georg Poier, Michael Opitz, Samuel Schulter and Peter Roth
17:30	Social Event Retz Underground Tour
19:00	Dinner

Workshop Program

Tuesday, February 7

09:00	Invited talk Wilhelm Burger Computer Vision - Mission Accomplished or Punk?
	Session 2: Depth + Learning Session chair: Janez Pers
10:00	Pedestrian Detection in RGB-D Images from an Elevated Viewpoint Christian Ertler, Horst Possegger, Michael Opitz and Horst Bischof
10:25	Localization of Facial Landmarks in Depth Images using Gated Multiple Ridge Descent* Janez Krizaj, France Mihelic and Vitomir Struc
10:50	Coffee break
	Session 3: Applications in Computer Vision Session chair: Wilhelm Burger
11:15	Visual Language Identification from Facial Landmarks* Radim Spetlik, Vojtech Franc, Jan Cech and Jiri Matas
11:40	LBP Scale Space Origins for Shape Classification Ines Janusch and Walter G. Kropatsch
12:05	From trajectories to behaviors: an algorithm to track and describe dancing birds Leonardo Oliva, Alessia Saggese, Nicole M. Artner, Walter G. Kropatsch and Mario Vento
12:30	Lunch
	Session 4: Posters Session chair: Walter G. Kropatsch
14:00	Poster teasers

* paper not published at CVWW2017

14:10	Poster presentations:
	Laser plane rangefinder, reimplementation and tool* Jakub Cmiral, Pavel Krsek and Vaclav Hlavac
	Uncertainty Computation in Large 3D Reconstruction* Michal Polic and Tomas Pajdla
	Accurate Calibration of Multiple Cameras and LiDAR Sensors* Zoltán Pusztai and Levente Hajder
	Automatic Stabilization of Image Sequences Bertram Sabrowsky-Hirsch
	Analysis and Calibration of a Mirror Setup producing Mirror-reflected, Multi-view Videos Gianluigi Mucciolo, Barbara Koneczny, Alessia Saggese, Nicole M. Artner, Walter G. Kropatsch and Mario Vento
	Towards large-scale traffic sign detection and recognition Peter Ursic, Domen Tabernik, Rok Mandeljc and Danijel Skocaj
	Observation of Selected Human Physiological Parameters Using Computer Vision Gregor Koporec, Rok Mandeljc, Vildana Sulič Kenk, Goran Vučković, Radoje Milić and Janez Perš
	Spotting Facial Micro-Expressions 'In the Wild' Petr Husák, Jan Čech and Jiří Matas
15:30	Coffee break
	Session 5: 3D Vision + Robotics Session chair: Vasek Hlavac
16:00	Towards Dense SLAM with High Dynamic Range Colors Sergey Alexandrov, Johann Prankl, Michael Zillich and Markus Vincze
16:25	Semantic segmentation for room categorization Ajda Lampe, Luka Čehovin, Rok Mandeljc and Matej Kristan
16:50	A Minimal Solution for Two-view Focal-length Estimation using Two Affine Correspondences* Baráth Dániel, Hajder Levente and Tekla Tóth
17:15	Object Scene Flow with Temporal Consistency Michal Neoral and Jan Šochman
19:00	Dinner

Workshop Program

Wednesday, February 8

09:00	Invited talk Ivan Viola Multi-Scale Molecular Data Visualization

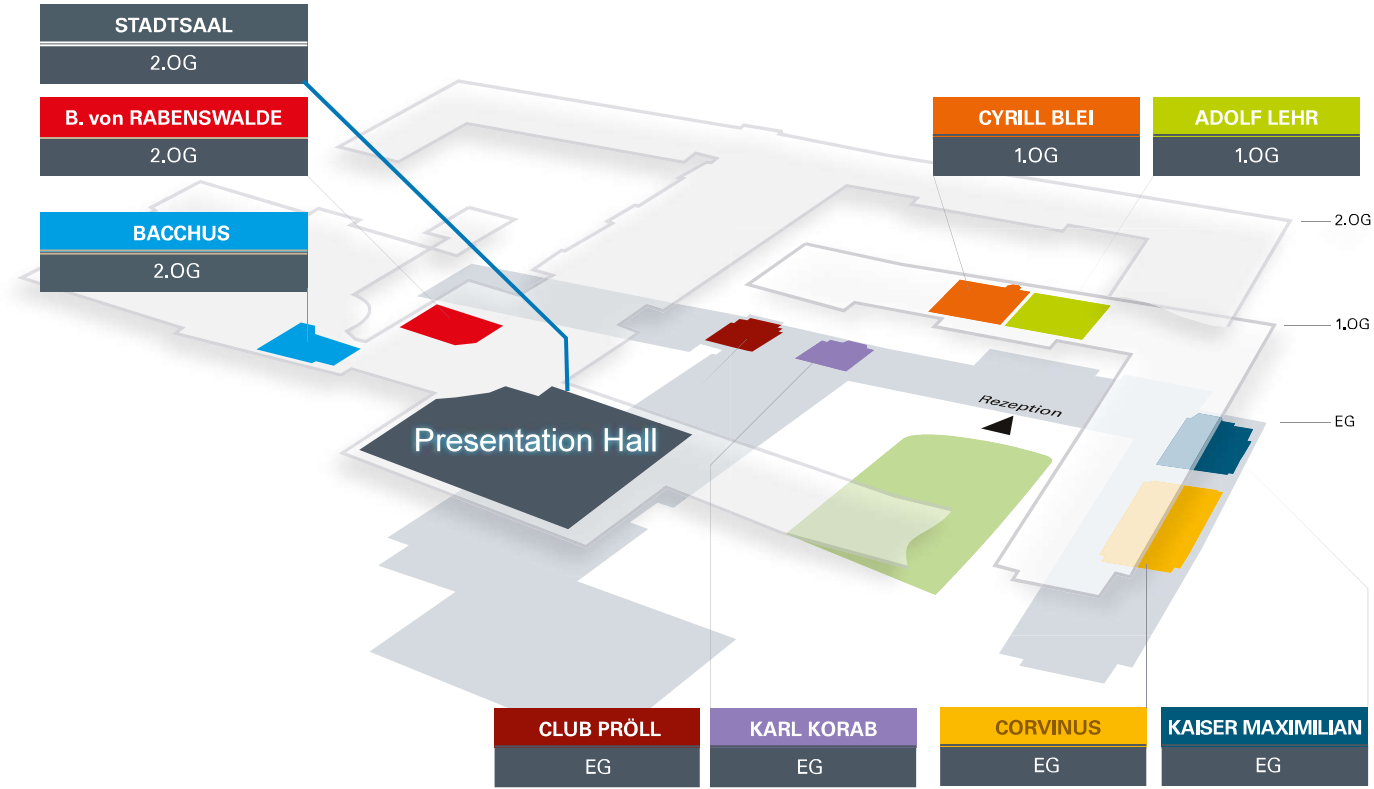
	Session 6: Optimization Session chair: Danijel Skočaj
10:00	Robust Data Whitening as an Iteratively Re-weighted Least Squares Problem* Arun Mukundan, Giorgos Tolias and Ondrej Chum
10:25	Real-Time Panoramic Tracking for Event Cameras* Christian Reinbacher, Gottfried Munda and Thomas Pock

10:50	Coffee break

	Session 7: Tracking Session chair: Peter M. Roth
11:15	Discriminative Correlation Filter with Channel and Spatial Reliability* Alan Lukežič, Tomáš Vojíř, Luka Čehovin, Jiří Matas and Matej Kristan
11:40	Beyond standard benchmarks: Parameterizing performance evaluation in visual object tracking* Luka Čehovin, Alan Lukežič, Ales Leonardis and Matej Kristan
12:05	Detection and Tracking of moving Objects by Flying Cameras using an Adaptive Test and Set Approach* Antonio Greco, Alessia Saggese, Giorgio Tozzi and Mario Vento

12:30	Workshop Closing Best Paper Award
12:45	Lunch

* paper not published at CVWW2017


STADTSAAL
2.OG
B. von RABENSWALDE
2.OG
BACCHUS
2.OG
CYRILL BLEI
1.OG
ADOLF LEHR
1.OG
2.OG
1.OG
EG
Rezeption
Presentation Hall
CLUB PRÖLL
EG
KARL KORAB
EG
CORVINUS
EG
KAISER MAXIMILIAN
EG