

Contents

Variational Models for Depth and Flow

Scene Flow Estimation from Light Fields via the Preconditioned Primal-Dual Algorithm	3
<i>Stefan Heber and Thomas Pock</i>	
Introducing More Physics into Variational Depth-from-Defocus	15
<i>Nico Persch, Christopher Schroers, Simon Setzer, and Joachim Weickert</i>	

Reconstruction

High-Resolution Stereo Datasets with Subpixel-Accurate Ground Truth	31
<i>Daniel Scharstein, Heiko Hirschmüller, York Kitajima, Greg Krathwohl, Nera Nešić, Xi Wang, and Porter Westling</i>	
Semi-Global Matching: A Principled Derivation in Terms of Message Passing	43
<i>Amnon Drory, Carsten Haubold, Shai Avidan, and Fred A. Hamprecht</i>	
Submap-Based Bundle Adjustment for 3D Reconstruction from RGB-D Data	54
<i>Robert Maier, Jürgen Sturm, and Daniel Cremers</i>	

Bio-informatics

A Hierarchical Bayesian Approach for Unsupervised Cell Phenotype Clustering	69
<i>Mahesh Venkata Krishna and Joachim Denzler</i>	
Information Bottleneck for Pathway-Centric Gene Expression Analysis	81
<i>David Adametz, Mélanie Rey, and Volker Roth</i>	

Deep Learning and Segmentation

Convolutional Decision Trees for Feature Learning and Segmentation	95
<i>Dmitry Laptev and Joachim M. Buhmann</i>	
A Deep Variational Model for Image Segmentation	107
<i>René Ranftl and Thomas Pock</i>	

Feature Computation

- Robust PCA: Optimization of the Robust Reconstruction Error Over the Stiefel Manifold. 121
Anastasia Podosinnikova, Simon Setzer, and Matthias Hein
- An $\mathcal{O}(n \log n)$ Cutting Plane Algorithm for Structured Output Ranking 132
Matthew B. Blaschko, Arpit Mittal, and Esa Rahtu
- Exemplar-Specific Patch Features for Fine-Grained Recognition 144
Alexander Freytag, Erik Rodner, Trevor Darrell, and Joachim Denzler

Video Interpretation

- Motion Segmentation with Weak Labeling Priors 159
Hodjat Rahmati, Ralf Dragon, Ole Morten Aamo, Luc van Gool, and Lars Adde
- Object-Level Priors for Stixel Generation. 172
Marius Cordts, Lukas Schneider, Markus Enzweiler, Uwe Franke, and Stefan Roth
- Coherent Multi-sentence Video Description with Variable Level of Detail 184
Anna Rohrbach, Marcus Rohrbach, Wei Qiu, Annemarie Friedrich, Manfred Pinkal, and Bernt Schiele

Segmentation and Labeling

- Asymmetric Cuts: Joint Image Labeling and Partitioning 199
Thorben Kroeger, Jörg H. Kappes, Thorsten Beier, Ullrich Koethe, and Fred A. Hamprecht
- Mind the Gap: Modeling Local and Global Context in (Road) Networks 212
Javier A. Montoya-Zegarra, Jan D. Wegner, Lubor Ladický, and Konrad Schindler

Image Processing and Analysis

- Guided Image Super-Resolution: A New Technique for Photogeometric Super-Resolution in Hybrid 3-D Range Imaging 227
Florin C. Ghesu, Thomas Köhler, Sven Haase, and Joachim Hornegger
- Image Descriptors Based on Curvature Histograms 239
Philipp Fischer and Thomas Brox

Human Pose and People Tracking

Test-Time Adaptation for 3D Human Pose Estimation 253
Sikandar Amin, Philipp Müller, Andreas Bulling, and Mykhaylo Andriluka

Efficient Multiple People Tracking Using Minimum Cost Arborescences 265
Roberto Henschel, Laura Leal-Taixé, and Bodo Rosenhahn

Capturing Hand Motion with an RGB-D Sensor, Fusing a Generative Model
with Salient Points 277
Dimitrios Tzionas, Abhilash Srikantha, Pablo Aponte, and Juergen Gall

Interpolation and Inpainting

Flow and Color Inpainting for Video Completion 293
Michael Strobel, Julia Diebold, and Daniel Cremers

Spatial and Temporal Interpolation of Multi-view Image Sequences. 305
Tobias Gurdan, Martin R. Oswald, Daniel Gurdan, and Daniel Cremers

Pose Normalization for Eye Gaze Estimation and Facial Attribute Description
from Still Images 317
Bernhard Egger, Sandro Schönborn, Andreas Forster, and Thomas Vetter

Posters

Probabilistic Progress Bars 331
Martin Kiefel, Christian Schuler, and Philipp Hennig

Wide Base Stereo with Fisheye Optics: A Robust Approach
for 3D Reconstruction in Driving Assistance 342
Jose Esparza, Michael Helmle, and Bernd Jähne

Detection and Segmentation of Clustered Objects by Using Iterative
Classification, Segmentation, and Gaussian Mixture Models and Application
to Wood Log Detection 354
Christopher Herbon, Klaus Tönnies, and Bernd Stock

Tracking-Based Visibility Estimation 365
*Stephan Lenor, Johannes Martini, Bernd Jähne, Ulrich Stopper,
Stefan Weber, and Florian Ohr*

Predicting the Influence of Additional Training Data on Classification
Performance for Imbalanced Data 377
Stephen Kockentiedt, Klaus Tönnies, and Erhardt Gierke

Signal/Background Classification of Time Series for Biological Virus Detection.	388
<i>Dominic Siedhoff, Hendrik Fichtenberger, Pascal Libuschewski, Frank Weichert, Christian Sohler, and Heinrich Müller</i>	
Efficient Hierarchical Triplet Merging for Camera Pose Estimation	399
<i>Helmut Mayer</i>	
Lens-Based Depth Estimation for Multi-focus Plenoptic Cameras	410
<i>Oliver Fleischmann and Reinhard Koch</i>	
Efficient Metropolis-Hasting Image Analysis for the Location of Vascular Entity	421
<i>Henrik Skibbe, Marco Reisert, and Shin Ishii</i>	
Automatic Determination of Anatomical Correspondences for Multimodal Field of View Correction	432
<i>Hima Patel, Karthik Gurumoorthy, and Seshadri Thiruvankadam</i>	
Encoding Spatial Arrangements of Visual Words for Rotation-Invariant Image Classification	443
<i>Hafeez Anwar, Sebastian Zambanini, and Martin Kampel</i>	
Accurate Detection in Volumetric Images Using Elastic Registration Based Validation	453
<i>Dominic Mai, Jasmin Dürr, Klaus Palme, and Olaf Ronneberger</i>	
A Human Factors Study of Graphical Passwords Using Biometrics	464
<i>Benjamin S. Riggan, Wesley E. Snyder, Xiaogang Wang, and Jing Feng</i>	
Pedestrian Orientation Estimation	476
<i>Joe Lallemand, Alexandra Ronge, Magdalena Szczot, and Slobodan Ilic</i>	
Distance-Based Descriptors and Their Application in the Task of Object Detection	488
<i>Radovan Fusek and Eduard Sojka</i>	
Hough Forests Revisited: An Approach to Multiple Instance Tracking from Multiple Cameras	499
<i>Georg Poier, Samuel Schulter, Sabine Sternig, Peter M. Roth, and Horst Bischof</i>	
Graph-Based and Variational Minimization of Statistical Cost Functionals for 3D Segmentation of Aortic Dissections.	511
<i>Cosmin Adrian Morariu, Tobias Terheiden, Daniel Sebastian Dohle, Konstantinos Tsagakis, and Josef Pauli</i>	

Mask-Specific Inpainting with Deep Neural Networks 523
Rolf Köhler, Christian Schuler, Bernhard Schölkopf, and Stefan Harmeling

Detection of Clustered Objects in Sparse Point Clouds Through 2D
Classification and Quadric Filtering 535
Christopher Herbon, Benjamin Otte, Klaus Tönnies, and Bernd Stock

On the Second Order Statistics of Essential Matrix Elements 547
M. Hossein Mirabdollah and Bärbel Mertsching

Geometric Reasoning for Uncertain Observations of Man-Made Structures . . . 558
Jochen Meidow

Locality Sensitive Hashing Using GMM 569
Fabian Schmieder and Bin Yang

Coded Aperture Flow 582
Anita Sellent and Paolo Favaro

Kernel Density Estimation for Post Recognition Score Analysis 593
Sebastian Sudholt, Leonard Rothacker, and Gernot A. Fink

Recognizing Scene Categories of Historical Postcards 604
Rene Grzeszick and Gernot A. Fink

A Stochastic Late Fusion Approach to Human Action Recognition
in Unconstrained Images and Videos 616
*Muhammad Shahzad Cheema, Abdalrahman Eweawi,
and Christian Bauckhage*

A Dense Pipeline for 3D Reconstruction from Image Sequences 629
Timm Schneevogt, Christopher Schroers, and Joachim Weickert

Active Online Learning for Interactive Segmentation Using Sparse Gaussian
Processes 641
Rudolph Triebel, Jan Stühmer, Mohamed Souiai, and Daniel Cremers

Multi-view Tracking of Multiple Targets with Dynamic Cameras 653
Till Kroeger, Ralf Dragon, and Luc Van Gool

Quality Based Information Fusion in Fully Automatized Celiac Disease
Diagnosis 666
Michael Gadermayr, Andreas Uhl, and Andreas Vecsei

Fine-Grained Activity Recognition with Holistic and Pose Based Features . . . 678
Leonid Pishchulin, Mykhaylo Andriluka, and Bernt Schiele

Obtaining 2D Surface Characteristics from Specular Surfaces 690
Mathias Ziebarth, Markus Vogelbacher, Sabine Olawsky, and Jürgen Beyerer

Learning Must-Link Constraints for Video Segmentation
Based on Spectral Clustering 701
Anna Khoreva, Fabio Galasso, Matthias Hein, and Bernt Schiele

Young Researcher Forum

Automatic 3D Reconstruction of Indoor Manhattan World Scenes
Using Kinect Depth Data 715
Dominik Wolters

Can Cosegmentation Improve the Object Detection Quality? 722
Timo Lüddecke

Multi-atlas Based Segmentation of Corpus Callosum on MRIs
of Multiple Sclerosis Patients 729
Anneke Meyer

Committees of Deep Feedforward Networks Trained with Few Data 736
Bogdan Miclut

Gas Bubble Shape Measurement and Analysis 743
Claudius Zelenka

Scene Segmentation in Adverse Vision Conditions 750
Evgeny Levinkov

Learning Multi-scale Representations for Material Classification 757
Wenbin Li

Casting Random Forests as Artificial Neural Networks (and Profiting from It) . . . 765
Johannes Welbl

Author Index 773



<http://www.springer.com/978-3-319-11751-5>

Pattern Recognition

36th German Conference, GCPR 2014, Münster,
Germany, September 2-5, 2014, Proceedings

Jiang, X.; Hornegger, J.; Koch, R. (Eds.)

2014, XVIII, 775 p. 310 illus., Softcover

ISBN: 978-3-319-11751-5