GCPR 2013



CONFERENCE DIGEST

35th German Conference on Pattern Recognition Saarbrücken, September 3-6, 2013









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1 Preface

Welcome to Saarbrücken and to the 35th German Conference on Pattern Recognition (GCPR).

This year's conference differs in several aspects from the previous ones: Perhaps the most evident difference is the transition to an English name. Previous conferences were named *DAGM Symposium Mustererkennung*, which translates to *Symposium of the German Association for Pattern Recognition*. To reflect the stronger internationalization that had taken place in the last decade, it was felt appropriate to switch to an English name. Furthermore, we extended the program committee (PC) by a larger number of experts from outside Germany than previous DAGM conferences. In total we have been supported by 54 PC members from 11 countries.

In spite of the fact that this year there were extraordinary many related conference deadlines in the submission month, our call for papers resulted in 79 submissions from institutions from 15 countries. Each paper underwent a rigorous double-blind reviewing procedure by three PC members, sometimes with support from additional experts. In total, 40 out of 79 submissions have been accepted, 22 for oral presentation and 18 for poster presentation. The program covers the entire spectrum of pattern recognition, machine learning, image processing, and computer vision. We thank all reviewers for their valuable service to our scientific community and all authors for their GCPR submissions.

We are happy that three world leaders in their field have accepted our invitation to give a keynote lecture at GCPR 2013: Jitendra Malik (UC Berkeley, USA), Jean-Michel Morel (ENS Cachan, France), and Gene Myers (MPI of Molecular Cell Biology and Genetics, Dresden, Germany).

The program of GCPR 2013 is enriched by a number of additional events. As in previous years, also GCPR 2013 features a Young Researchers' Forum (YRF), where bachelor or master students can present their work as a poster. From 5 submissions, 3 have been selected for the YRF.

Another event is a *Special Session on Robust Optical Flow*, where Raquel Urtasun (TTIC, Chicago, USA) gives an invited talk.

A real novelty in the history of GCPR is the *Related Research Results* (R^3) *Poster Session*. It is intended as a communication platform for participants who do not present an accepted paper at GCPR 2013. These people can display a poster that describes one of their best conference or journal publications

6 Preface

within the last two years that they would like to discuss with the GCPR 2013 participants. Our call was remarkably successful: The R³ Poster Session features 31 contributions.

In the day before the main conference, three satellite workshops take place: one on *Unsolved Problems in Pattern Recognition and Computer Vision*, one one *Imaging New Modalities*, and one on *New Challenges in Neural Computation and Machine Learning*. In parallel to these three workshops, we have half-day tutorials on *Computational Plenoptic Imaging* and on *Shape from Shading in Theory and Algorithms*.

It is our pleasure to thank Bosch, Fraunhofer ITWM, Google, the Intel Visual Computing Institute, MVTec, Toyota, and Ersatzteile-24 for their generous sponsorship of GCPR 2013. Moreover, we thank Mark Groves, the dean of the Faculty of Mathematics and Computer Science, for allowing us to use the premises of the faculty for this conference. We are also grateful to the KWT for their organizatorial support. Last but not least, a big thanks goes to our administrative assistants Cornelia Balzert, Irmtraud Stein, and Ellen Wintringer for their great support, and to Nico Persch for his valuable help in assembling the proceedings volume and this program booklet.

We wish you an exciting conference, and we look forward to next year's conference in Münster.

September 2013

Joachim Weickert Matthias Hein Bernt Schiele

2 PEOPLE

2.1 Organizers

General Chair: Joachim Weickert (Saarland University)

Program Co-Chairs: Matthias Hein (Saarland University) Bernt Schiele (MPI for Informatics)







2.2 Program Committee

Luis Alvarez Universidad de Las Palmas de Gran Canaria, Spain

Horst Bischof Technical University of Graz, Austria
Thomas Brox University of Freiburg, Germany
Andrés Bruhn University of Stuttgart, Germany

Joachim Buhmann ETH Zurich, Switzerland

Daniel Cremers Technical University of Munich, Germany

Andreas Dengel Technical University of Kaiserslautern, Germany

Joachim Denzler University of Jena, Germany Michael Felsberg Linköping University, Sweden

Gernot Fink Technical University of Dortmund, Germany

Boris Flach Czech Technical University, Prague, Czech Republic

Jan-Michael Frahm University of North Carolina, USA

Uwe Franke Daimler AG, Germany

Juergen Gall MPI for Intelligent Systems, Tübingen, Germany Peter Gehler MPI for Intelligent Systems, Tübingen, Germany Michael Goesele Technical University of Darmstadt, Germany 8 People

Fred Hamprecht University of Heidelberg, Germany
Olaf Hellwich Technical University of Berlin, Germany

Vaclav Hlavac Czech Technical University, Prague, Czech Republic

Joachim Hornegger University of Erlangen-Nuremberg, Germany

Xiaoyi Jiang University of Münster, Germany Reinhard Koch University of Kiel, Germany

Walter Kropatsch Vienna University of Technology, Austria Christoph Lampert IST Austria, Klosterneuburg, Austria

Bastian Leibe RWTH Aachen, Germany
Ales Leonardis University of Birmingham, UK

Marco Loog Delft University of Technology, Netherlands
Diana Mateus Technical University of Munich, Germany
Helmut Mayer Bundeswehr University Munich, Germany

Rudolf Mester University of Frankfurt, Germany

Fernand Meyer Mines Paris Tech, France Krystian Mikolajczyk University of Surrey, UK

Klaus-Robert Müller Technical University of Berlin, Germany
Mads Nielsen University of Copenhagen, Denmark
Sebastian Nowozin Microsoft Research, Cambridge, UK
Thomas Pock Technical University of Graz, Austria
Gerhard Rigoll Technical University of Munich, Germany

Olaf Ronneberger University of Freiburg, Germany Bodo Rosenhahn University of Hannover, Germany

Stefan Roth Technical University of Darmstadt, Germany

Volker Roth University of Basel, Switzerland
Carsten Rother Microsoft Research, Cambridge, UK
Hanno Scharr Forschungszentrum Jülich, Germany

Daniel Scharstein Middlebury College, USA

Christoph Schnörr University of Heidelberg, Germany

Rainer Stiefelhagen
Peter Sturm
Christian Theobalt

Karlsruhe Institute of Technology, Germany
INRIA Grenoble - Rhone-Alpes, France
MPI for Informatics, Saarbrücken, Germany

Klaus-Dieter Tönnies University of Magdeburg, Germany

Joost van de Weijer Autonomous University of Barcelona, Spain

Thomas Vetter University of Basel, Switzerland University of Braunschweig, Germany

Martin Welk UMIT Hall, Austria

3 LOCAL ARRANGEMENTS

3.1 Venue

The GCPR 2013 will be held at Saarland University Campus. Workshops and tutorials will take place on Tuesday, September 3rd. The main conference will be held from Wednesday, September 4th to Friday, September 6th.

A map of the campus with corresponding places of events can be found on Page 16.

3.2 Registration

On Tuesday, the registration desk will be in the ground floor of Building E 1.3. From Wednesday to Friday, the registration desk will be at the ground floor of Building E 2.2 (Günter Hotz Lecture Hall).

If you have questions, you can contact anybody with a red name badge.

3.3 Name Badge and Public Transport

Please wear your name badge all the time. Depending on your registration status, it may contain symbols that give you access to the workshops and tutorials (symbol "W"), the main conference (symbol "M"), the welcome reception (symbol "R"), the conference dinner (symbol "D"), and it also serves as public transport ticket (orange symbol "S").

If you have the orange symbol "S" on your badge, you have free public transport within Saarbrücken. The bus network is displayed on Page 11. On your first ride to the campus of Saarland University, please buy a ticket at the ticket machine or the bus driver.

3.4 Parking

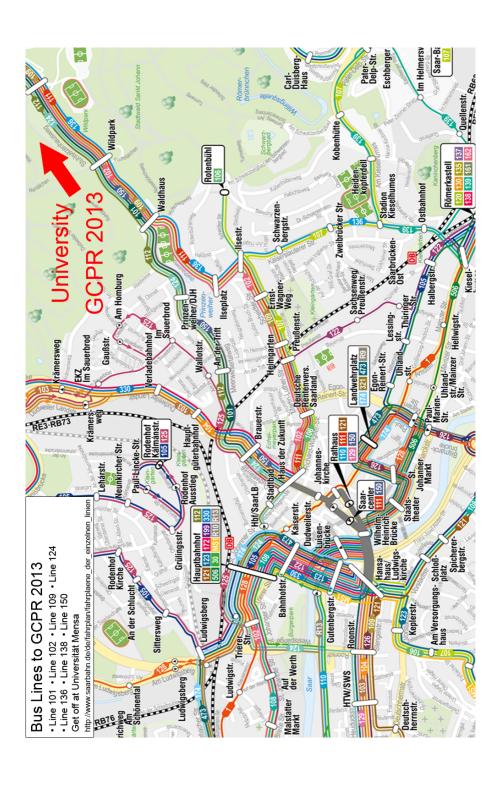
If your arrive by car, please use the car park in front of the entrance east (Parkhaus Ost) and press the ticket button. At the conference registration desk, please ask for a 4-day ticket for free parking.

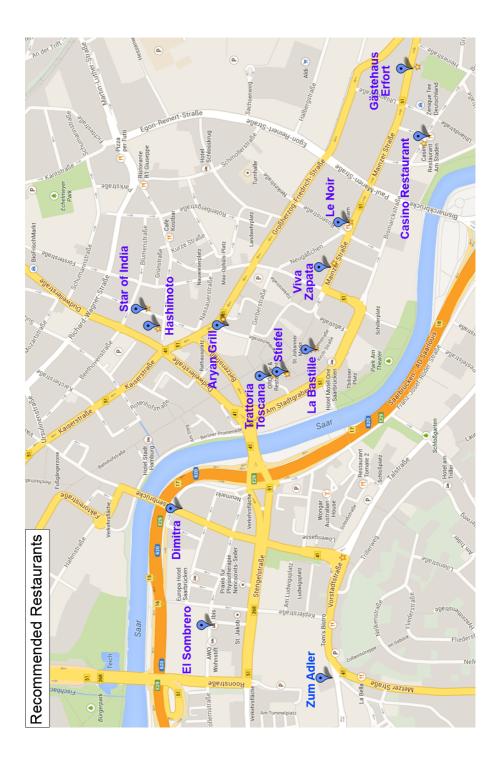
3.5 Tickets for the Canteen

If you are registered as a regular participant, your envelope contains lunch tickets for the canteen (Mensa). Student participants do not have these free lunch tickets. They can pay in cash for all dishes apart from the menu "A". For menu "A" they can buy a ticket at the canteen register beforehand.

3.6 Internet Access

Internet access will be provided by the Wifi network of the campus. You can find the necessary information and code for internet access in your bag. If you have an Eduroam account, you can use it here.





3.7 Restaurants in the City Center

Traditional Regional Dishes

Gasthaus "Zum Stiefel"

Am Stiefel 2

Tel.: +49-681-93 64 50

http://www.stiefelgastronomie.de

Various regional dishes.

Don't miss their excellent homebrewed beer.

Price level € - €€.

(Mon-Sat 11:45-14, 17:30-23)

■ La Bastille

Kronenstraße 1B

Tel. +49-681-3 10 64

http://www.la-bastille.de

One of the best places to eat "Dibbelabbes",

a saarlandic potato speciality.

Price level \in - \in €.

(Tue-Fri 12-14:30 and 18-23, Sat 12-23, Sun 18-23)

Zum Adler

Deutschherrnstraße 2

Tel.: +49-681-5 28 41

Old restaurant with ancient atmosphere (including their restrooms :-)).

Simple French cuisine. Check out their daily specials.

Price level \in - \in €.

(daily as of 18)

Gourmet Restaurants

Casino Restaurant am Staden

Bismarckstraße 47

Tel.: +49-681-6 23 64

http://www.casino-kaiserhof.de

Fairly good food in a very nice atmosphere.

Please call them for a reservation.

Price Level €€ - €€€. (daily 11:30-14:30, 18-22)

Le Noir

Mainzer Straße 26

Tel.: +49-681-9 68 19 88

http://www.lenoir-restaurant.de Gourmet dishes of excellent quality.

Two Michelin stars (one of the 50 best restaurants in Germany).

Price level $\in \in \in - \in \in \in \in$.

Less expensive lunch menues.

(Tue-Sat 12-14:30, Mon-Sat 18:30-23:30)

Gästehaus Erfort

Mainzer Straße 95

Tel.: +49-681-9 58 26 82

http://www.gaestehaus-erfort.de

One of the ten best restaurants in Germany:

Three Michelin stars, 19 Gault Millau points.

Outstanding gourmet cuisine with corresponding price level €€€€.

(Tue-Fri 12-14, 19-22:15, Sat 19-22:15)

International Dishes

■ Trattoria Toscana

Fröschengasse 18-20

Tel.: +49-681-9 10 18 95

http://www.trattoriatoscana-sb.de

Italian restaurant with a nice atmosphere.

Price level €€.

(Mon-Fri 11-15, 17-24, Sat, Sun 11-24)

Restaurant Dimitra

Eisenbahnstraße 68

Tel. +49-681-5 84 63 65

http://www.speisekarte24.de/restaurant/ansicht

/dimitra_in_saarbruecken_51

Greek dishes.

Price level €€. (daily 11:30-15, 18-24)

■ Viva Zapata

Mainzer Straße 8

Tel.: +49-681-37 56 47

http://www.vivazapata.info

Tapas bar.

Price level €€.

(Mon-Fri 11:30-14, 18-01)

El Sombrero

Hohenzollernstraße 41

Tel. +49-681-5 84 69 62

http://www.el-sombrereo.de

Mexican specialities.

Price level €€.

(Mon-Fri 17-24, Sat 16-24, Sun 11-23:30)

Aryan Grill / Parkhausgrill

Großherzog-Friedrich-Straße / Am Parkdeck

Fast food place with fairly good falafel and döner kebab.

Price level €.

(daily until at least 23)

Star of India

Johannisstraße 17

Tel.: +49-681-3 11 68

http://www.star-of-india.de/intro.htm

Indian food. Not too spicy.

Price level € - €€.

(Tue-Sun 18:30-23)

Hashimoto

Cecilienstraße 7

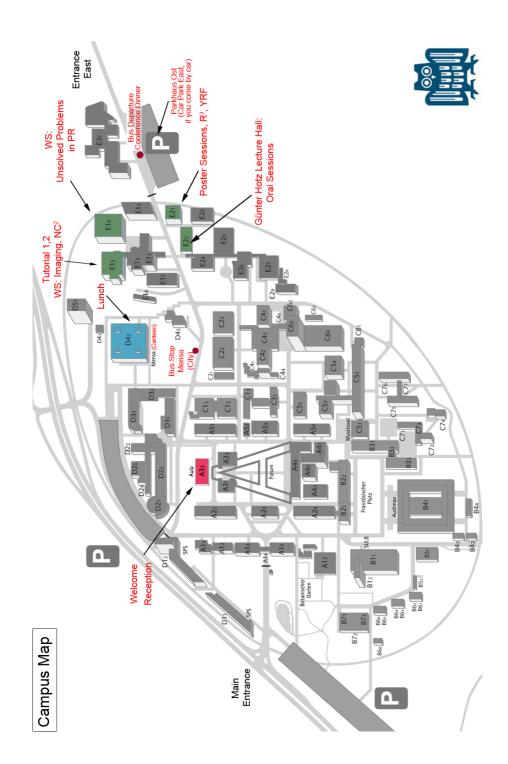
Tel.: +49-681-39 80 34

http://hashimoto-saar.de/

High quality Japanese dishes.

Price level €€€.

(Tue-Fri, Sun 12-14:30; Tue-Sun 18:30-22:30)



4.1 Tuesday, September 3rd



Building E1.3

Registration 8:15-9:00

Campus E1.3, Ground Floor

Tutorial 1: Shape from Shading in Theory and Algorithms 9:00-12:30

Campus E1.3, Ground Floor, Lecture Hall 001

Lecturer: Michael Breuß (TU Cottbus)

Shape from Shading (SfS) is a classic task in computer vision with many interesting applications. Given a single input image, the aim of SfS is to infer the three-dimensional structure of depicted objects. This is done at hand of assumptions on illumination and reflectance in the scene.

In this tutorial we consider classic foundations as well as modern methods. First we review some milestones in the history of SfS. Thereby we examine underlying assumptions and properties of SfS models. After that we focus on the rapid developments in this field within the last ten years. We consider the mathematical basis and efficient algorithms for SfS models that mark the current state of the art.

Lunch break 12:30-14:00

Campus D4.1, Mensa

See Page 10 for more information on the canteen.

Tutorial 2: Computational Plenoptic Imaging

14:00-17:30

Campus E1.3, Ground Floor, Lecture Hall 001

Lecturer: Ivo Ihrke (INRIA Bordeaux)

The plenoptic function is a ray-based model for light that includes the color spectrum as well as spatial, temporal, and directional variation. Although digital light sensors have greatly evolved in the last years, one fundamental limitation remains: all standard CCD and CMOS sensors integrate over the dimensions of the plenoptic function as they convert photons into electrons; in the process, all visual information is irreversibly lost, except for a two-dimensional, spatially-varying subset - the common photograph. In this tutorial, we review approaches that optically encode the dimensions of the plenpotic function transcending those captured by traditional photography and reconstruct the recorded information computationally.

Workshop 1: 9:00-17:30

Unsolved Problems in Pattern Recognition and Computer Vision

Campus E1.4, Ground Floor, Seminar Room 024

Organizer: Bernt Schiele (MPI for Informatics, Saarbrücken)



Building E1.4

The Technical Committee of the German Association for Pattern Recognition (DAGM) invites to this workshop that provides a platform for discussing the major challenges of pattern recognition and computer vision in the next years. The event is an opportunity to take a step back from the daily business and debate about the currently most relevant problems in the field and emphasize the most promising future research directions.

9:00- 9:30	Computational Architectures for Visual Recognition Jitendra Malik (UC Berkeley)
9:30-10:00	Next Challenges in Dynamic Scene Understanding: Beyond Tracking Bastian Leibe (RWTH Aachen)
10:00-10:30	Beyond the Closed-World Assumption: The Importance of Novelty Detection and Open Set Recognition <i>Joachim Denzler, Erik Rodner, Paul Bodesheim, and Alexander Freytag (U Jena)</i>

10:30-11:00	Coffee Break (E1.3, Ground Floor)
11:00-11:30	The Mirage of a General Purpose Robot and the Combinatorial Explosion Thomas Brox (U Freiburg)
11:30-12:00	The Quest for Robustness and Accuracy - Mission Impossible? *Uwe Franke (Daimler)*
12:00-12:30	Ground Truth Generation Daniel Kondermann (U Heidelberg)
12:30-14:00	Lunch Break (D4.1, Mensa) See Page 10.
14:00-14:30	What Matters More for Image Matching and the Comparison of Descriptors: Invariance and Causality Requirements or Repeatability Criteria? Jean-Michel Morel (ENS Cachan)
14:30-15:00	Decision Making under Uncertainty: How Informative is your Algorithm with Noisy Inputs and Internal Computation Errors? Joachim Buhmann (ETH Zurich)
15:00-15:30	An Open Challenge in Computer Vision: From Inverse Rendering to Scene Understanding Carsten Rother (TU Dresden)
15:30-16:00	Coffee Break (E1.3, Ground Floor)
16:00-17:30	Podium Discussions

Workshop 2: Imaging New Modalities

9:00-17:30

Campus E1.3, Ground Floor, Lecture Hall 003

Organizers: Reinhard Koch (U Kiel), Andreas Kolb (U Siegen), Eli Angelopoulou (U Erlangen),

Ivo Ihrke (INRIA Bordeaux)

In recent years, a large set of different new imaging sensors technologies have been introduced, either on commercial or consumer level. One of the most prominent examples are range sensors like time-of-flight cameras or the Kinect sensor, but also light field cameras and multispectral sensors have drawn a lot of attention.

This workshop aims at the challenges related to processing the imagery data delivered by these new camera-like sensors. Many processing approaches developed in computer vision have been applied to this kind of sensor data. However, in many the algorithmic principles had to be adopted significantly (e.g. due to various different sensor characteristics) or completely new approaches have been developed.

The workshop will bring together researchers to exchange their ideas for and insight into processing challenges and novel processing paradigms associated with these sensor data types.

9:00- 9:10	Welcome Address
9:10-10:05	Keynote Light-in-Flight: Transient Imaging using Photonic Mixer Devices Wolfgang Heidrich (UBC Vancouver)
10:05-10:30	On the Calibration of Focused Plenoptic Cameras Ole Johannsen, Christian Heinze, Bastian Goldluecke, and Christian Perwass
10:30-11:00	Coffee Break and Demos by PMDTec and Raytrix
11:00-11:40	Invited Talk Real-time 3D Reconstruction at Scale using Voxel Hashing Marc Stamminger (U Erlangen)
11:40-12:05	A State of the Art Report on Kinect Sensor Setups in Computer Vision. Kai Berger, Stephan Meister, Rahul Nair, Daniel Kondermann
12:05-12:20	Product Presentation of PMD Technologies GmbH
12:20-12:35	Product Presentation of Raytrix GmbH
12:35-14:00	Lunch Break (D4.1, Mensa) See Page 10.

14:00-14:40	Invited Talk Variational Methods in Light Field Analysis. Bastian Goldlücke (U Heidelberg)
14:40-15:05	Real-time Image Stabilization for ToF Cameras on Mobile Platforms Benjamin Langmann, Klaus Hartmann, and Otmar Loffeld
15:05-15:30	Real-Time Motion Artifact Compensation for PMD-ToF Images Thomas Högg, Damien Lofloch, and Andreas Kolb
15:30-16:00	Coffee Break and Demos by PMDTec and Raytrix
16:00-16:40	Invited Talk Medical Range Imaging Joachim Hornegger (U Erlangen)
16:40	Farewell Note

Workshop 3: 9:00-19:00

New Challenges in Neural Computation and Machine Learning (NC²)

Campus E1.3, Ground Floor, Seminar Room 016

Organizers: Barbara Hammer (U Bielefeld),

Thomas Martinetz (U Lübeck),

Thomas Villmann (U Appl Sci Mittweida)

This workshop takes place for the fourth time as a workshop jointly organized by the GI Fachgruppe Neuronale Netze and by the German Neural Networks Society. The goal of the workshop is to provide a platform for researchers in the field to exchange ideas about ongoing work, open problems, challenges, or also yet unsuccessful approaches in this domain, and to provide a gentle audience also for comparably new researchers in the field. During the workshop, a best presentation award will be given. The awardee will be selected by the participants of the workshop. Proceedings will be available in electronic form in the TR series Machine Learning Reports:

http://www.techfak.uni-bielefeld.de/~fschleif/mlr/mlr.html

After the success of last year, we plan a special issue in the journal Neuro-computing opening a platform towards research or discussions, which reach a matured state after the workshop.

9:00- 9:10 **Opening**

9:10-10:30 **Data Analysis**

Application of Maximum Distance Minimization to Gene Expression Data (short paper)

Jens Hocke and Thomas Martinetz

Practical Estimation of Missing Phosphorus Values in Pyhäjärvi Lake Data

Alexander Grigorievskiy, Marjo Tarvainen, Anne-Mari Ventelä, and Amaury Lendasse

Replacing the Time Dimension: A Self-Organizing Time Map over Any Variable

Peter Sarlin

Image-based Classification of Websites
Anton Akusok, Yoan Miche, and Amaury Lendasse

10:30-11:00 Coffee Break

11:00-12:30 Vision and Robotics

Combining Multiple Classifiers and Context Information for Detecting Objects under Real-world Occlusion Patterns

Marvin Struwe, Stephan Hasler, and Ute Bauer-Wersing

Anticipating Intentions as Gestalt Formation: A Model Based on Neural Competition

Martin Meier, Robert Haschke, and Helge Ritter

Tour Guide Robot

Sven Hellbach, Frank Bahrmann, Marc Donner Marian Himstedt, Mathias Klingner, Johannes Fonfara, Peter Poschmann, Richard Schmidt, and Hans-Joachim Boehme

Learning Dialog Management for a Tour Guide Robot Using Museum Visitor Simulation

Johannes Fonfara, Sven Hellbach, and Hans-Joachim Boehme

12:30-14:00 Lunch Break (D4.1, Mensa)

See Page 10

14:00-14:50 **Keynote Talk**

Challenges of High-dimensional Data Analysis from the Application's Perspective *Udo Seiffert (Fraunhofer IFF, Magdeburg)*

14:50-15:30 Prior Knowledge Integration

A Framework for Optimization of Statistical Classification Measures Based on Generalized Learning Vector Quantization

Marika Kaden and Thomas Villmann

Classifier Inspection Based on Different Discriminative Dimensionality Reductions

Alexander Schulz, Andrej Gisbrecht, and Barbara Hammer

15:30-16:00 Coffee Break

16:00-17:30 Local and Sparse Models

Learning the Appropriate Model Population Structures for Locally Weighted Regression

Slobodan Vukanovic, Alexander Schulz, Robert Haschke, and Helge Ritter

Learning in Networks of Similarity Processing Neurons Lluís Belanche

	Human Activity Classification with Online Growing Neural Gas Maximilian Panzner, Oliver Beyer, and Philipp Cimiano
	About the Equivalence of Robust Soft Learning Vector Quantization and Soft Nearest Prototype Classification Henry Schütze, Erhardt Barth, and Thomas Martinetz
17:45-18:00	Nomination of the Best Presentation Award and Closing
18:00-18:30	Meeting of the GI Fachgruppe Neuronale Netze
18:30-19:00	Meeting of the GNNS

Welcome Reception and Buffet

18:00-21:00

Campus A 3.3, Aula

For regular participants of the main conference, we offer a welcome buffet with local dishes. Everybody with an "R" symbol on the badge is admitted.



Building A3.3

GCPR Main Conference



Building E2.2

4.2 Wednesday, September 4th

Registration	8:15-9:00

Campus E2.2, Lower Ground Floor

Opening	9:00-9:15

Campus E2.2, Günter Hotz Lecture Hall

Welcome addresses by Mark Groves (Dean of the Faculty of Mathematics and Computer Science) and Joachim Weickert.

German Pattern Recognition Award

9:15-10:00

Chair: Joachim Buhmann

Campus E2.2, Günter Hotz Lecture Hall

The German Pattern Recognition Award 2013 will be awarded to a young scientist for outstanding contributions in the field of computer vision and pattern recognition. It is sponsored by Daimler AG and carries a cash award of 5,000 Euro.

Coffee Break 10:00-10:30

Campus E2.2, Lower Ground Floor

Oral Session: Stereo and Structure from Motion 10:30-12:15

Chair: Daniel Scharstein

Campus E2.2, Günter Hotz Lecture Hall

Reconstructing Reflective and Transparent Surfaces from Epipolar Plane Images

Sven Wanner and Bastian Goldluecke

Structure from Motion Using Rigidly Coupled Cameras without Overlapping Views

Sandro Esquivel and Reinhard Koch

- Highly Accurate Depth Estimation for Objects at Large Distances
 Peter Pinggera, Uwe Franke and Rudolf Mester
- A Low-Rank Constraint for Parallel Stereo Cameras Christian Cordes, Hanno Ackermann, and Bodo Rosenhahn

Lunch Break 12:15-13:45

Campus D4.1, Mensa

See Page 10 for more information on the canteen.

Invited Talk 13:45-14:45

Chair: Bernt Schiele

Campus E2.2, Günter Hotz Lecture Hall

■ The Three R's of Computer Vision: Recognition, Reconstruction and Reorganization

Jitendra Malik (UC Berkeley)

Over the last two decades, we have seen remarkable progress in computer vision with demonstration of capabilities such as face detection, handwritten digit recognition, reconstructing three-dimensional models of cities, automated monitoring of activities, segmenting out organs or tissues in biological images, and sensing for control of robots and cars. Yet there are many problems where computers still perform significantly below human perception. For example, in the recent PASCAL benchmark challenge on visual object detection, the average precision for most 3D object categories was under 50 %.

I will argue that further progress on the classic problems of computational vision: recognition, reconstruction and re-organization requires us to study the interaction among these processes. For example recognition of 3d objects benefits from a preliminary reconstruction of 3d structure, instead of just treating it as a 2D pattern classification problem. Recognition is also reciprocally linked to reorganization, with bottom-up grouping processes generating candidates, which with top-down activations of object and part detectors. In this talk, I will show some of the progress we have made towards the goal of a unified framework for the 3R's of computer vision. I will also point towards some of the exciting applications we may expect over the next decade as computer vision starts to deliver on even more of its grand promise.

Poster Spotlight Session (including YRF)

14:45-15:10

Chair: Thomas Brox

Campus E2.2, Günter Hotz Lecture Hall

Each presenter of a GCPR poster (including the Young Researchers' Forum) has 60 seconds to advertise his/her poster. The presentation order follows the number of the poster.

Coffee Break 15:10-15:30

Campus E2.2, Lower Ground Floor

Take your coffee and visit the Poster Session and YRF Forum.

Poster Session 15:10-17:00

Chair: Thomas Brox

Campus E2.1, Ground Floor



Building E2.1

- (P1) Multi-Resolution Range Image Integration for Multi-View Reconstruction
 Andreas Kuhn, Heiko Hirschmüller, and Helmut Mayer
- (P2) 3D Object Class Geometry Modeling with Spatial Latent Dirichlet Markov Random Fields Hanchen Xiong, Sandor Szedmak, and Justus Piater
- (P3) Discriminative Joint Non-negative Matrix Factorization for Human Action Classification

 Abdalrahman Eweiwi, Muhammad Shahzad Cheema, and Christian Bauckhage
- (P4) Joint Shape Classification and Labeling of 3-D Objects Using the Energy Minimization Framework

 Alexander Zouhar, Dmitrij Schlesinger, and Siegfried Fuchs

(P5)	A Coded 3d Calibration Method for Line-Scan Cameras
	Erik Lilienblum, Ayoub Al-Hamadi, and Bernd Michaelis

- (P6) Confidence-Based Surface Prior for Energy-Minimization Stereo Matching

 Ke Zhu, Daniel Neilson, and Pablo d'Angelo
- (P7) A Monte Carlo Strategy to Integrate Detection and Model-Based Face Analysis
 Sandro Schönborn, Andreas Forster, Bernhard Egger, and Thomas Vetter
- (P8) Scale-Aware Object Tracking with Convex Shape Constraints on RGB-D Images

 Maria Klodt, Daniel Cremers, and Jürgen Sturm
- (P9) Learning how to Combine Internal and External Denoising Methods

 Harold Christopher Burger, Christian Schuler, and Stefan Harmeling
- (P10) A Comparison of Directional Distances for Hand Pose Estimation Dimitrios Tzionas and Juergen Gall
- (P11) Approximate Sorting
 Ludwig Busse, Morteza Haghir Chehreghani, and Joachim Buhmann
- (P12) Sequential Gaussian Mixture Models for Two-Level Conditional Random Fields Sergey Kosov, Franz Rottensteiner, and Christian Heipke
- (P13) Synthezising Real World Stereo Challenges Ralf Haeusler and Daniel Kondermann
- (P14) Pedestrian Path Prediction with Recursive Bayesian Filters: A Comparative Study
 Nicolas Schneider and Dariu Gavrila
- (P15) An Improved Model for Estimating the Meteorological Visibility from a Road Surface Luminance Curve Stephan Lenor, Bernd Jähne, Stefan Weber, and Ulrich Stopper

- (P16) Performance Evaluation of Narrow Band Methods for Variational Stereo Reconstruction Franz Stangl, Mohamed Souiai, and Daniel Cremers
- (P17) Discriminative Detection and Alignment in Volumetric Data Dominic Mai, Philipp Fischer, Thomas Blein, Jasmin Duerr, Klaus Palme, Thomas Brox, and Olaf Ronneberger
- (P18) Distances based on Non-rigid Alignment for Comparison of Different Object Instances

 Benjamin Drayer and Thomas Brox

Young Researchers' Forum (Poster Session)

15:10-17:00

Chair: Thomas Brox

Campus E2.1, Ground Floor

- (Y1) Action Recognition with HOG-OF Features Florian Baumann
- (Y2) Image Based 6-DOF Camera Pose Estimation with Weighted RANSAC 3D Johannes Wetzel
- (Y3) Symmetry-Based Detection and Diagnosis of DCIS in Breast MRI Abhilash Srikantha

Special Oral Session on Robust Optical Flow

17:00-18:30

Chair: Andrés Bruhn

Campus E2.2, Günter Hotz Lecture Hall

■ Invited Talk: Low-level Vision for Autonomous Driving Raquel Urtasun (TTIC, Chicago)

Over the past few decades we have witnessed a great improvement in performance of low-level vision algorithms. As demonstrated by the Middlebury leader-board, problems such as stereo and optical flow estimation are mostly solved when dealing with imagery captured in the laboratory. Unfortunately, when dealing with real world problems most algorithms fail.

In this talk I'll show how autonomous driving can provide us with very challenging scenarios to push current algorithms to the next level. Furthermore, I'll argue that the next generation of low-level vision algorithms should be holistic and reason jointly about multiple related tasks such as recognition and perceptual grouping.

- An Evaluation of Data Cost Functions for Optical Flow Estimation Christoph Vogel, Konrad Schindler, and Stefan Roth
- Illumination Robust Optical Flow Model Based on Histogram of Oriented Gradients

Hatem Rashwan, Mahmoud Mohamed, Miguel Angel, Baerbel Mertsching, and Domenec Puig

DAGM Meeting

18:30-19:30

Campus E2.2, Günter Hotz Lecture Hall

The German Association for Pattern Recognition (DAGM) invites every DAGM member to the annual gathering.

4.3 Thursday, September 5th

Invited Talk 9:00-10:00

Chair: Joachim Weickert

Campus E2.2, Günter Hotz Lecture Hall

■ The Noise Clinic

Jean-Michel Morel (ENS Cachan)
Joint work with Antoni Buades, Miguel Colom, and Marc Lebrun.

All images have noise, but this noise may have undergone many distortions. Can we take any image, say, a scanned old photograph, and denoise it? This requires a good denoising method and an accurate noise estimator, both working for "any" image and "any" noise. I'll discuss both aspects, and particularly how to estimate a signal-dependent and scale-dependent noise, particularly noise that has been distorted by JPEG compression.

A prototype of the noise clinic is currently online at http://dev.ipol.im/~colom/ipol_demo/noise_clinic/(username: demo, password: demo).

This facility permits anyone to try on their own images and to browse through the results of the others in the archive. The main conclusion of the first experiments is that the noise estimation is the crucial point to get an efficient "noise clinic".

Coffee Break 10:00-10:30

Campus E2.2, Lower Ground Floor

Oral Session: Statistical Methods and Learning 10:30-12:15

Chair: Fred Hamprecht

Campus E2.2, Günter Hotz Lecture Hall

Ordinal Random Forests for Object Detection Samuel Schulter, Peter M. Roth, and Horst Bischof

Revisiting Loss-specific Training of Filter-based MRFs for Image Restoration

Yunjin CHEN, Thomas Pock, René Ranftl, and Horst Bischof

■ Labeling Examples that Matter: Relevance-Based Active Learning with Gaussian Processes

Alexander Freytag, Erik Rodner, Paul Bodesheim, and Joachim Denzler

■ Efficient Retrieval for Large Scale Metric Learning Martin Köstinger, Peter M. Roth, and Horst Bischof

Lunch Break 12:15-13:45

Campus D4.1, Mensa

13:45-15:30

Oral Session: Applications

Chair: Martin Welk

Campus E2.2, Günter Hotz Lecture Hall

- A Hierarchical Voxel Hash for Fast 3D Nearest Neighbor Lookup

 Bertram Drost and Slobodan Ilic
- Bone Age Assessment Using the Classifying Generalized Hough Transform

Ferdinand Hahmann, Inga Berger, Heike Ruppertshofen, Thomas Deserno, and Hauke Schramm

Framework for Generation of Synthetic Ground Truth Data for Driver Assistance Applications

Vladimir Haltakov, Christian Unger, and Slobodan Ilic

■ Refractive Plane Sweep for Underwater Images
Anne Jordt-Sedlazeck, Daniel Jung, and Reinhard Koch

R³ Spotlight Session

15:30-16:05

Chair: Olaf Ronneberger

Campus E2.2, Günter Hotz Lecture Hall

Each presenter of the ${\rm R}^3$ Poster Session has 60 seconds to advertise his/her poster. The presentation order follows the poster number.

Coffee Break 16:05-16:25

Campus E2.2, Lower Ground Floor

Take your coffee and visit the R³ Poster Session.

Recent Related Research (R³) Poster Session

16:05-18:30

Chair: Olaf Ronneberger

Campus E2.1, Ground Floor, Seminar Room 0.01

(R1) Fusion of Camera Images and Laser Scans for Wide Baseline 3D Scene Alignment in Urban Environments

Michael Ying Yang, Yanpeng Cao, and John McDonald ISPRS Journal of Photogrammetry and Remote Sensing, Vol. 66, pp. 52-16, 2011.

(R2) Fast Variational Multiview Segmentation through Backprojection of Spatial Contraints

Christian Reinbacher, M. Rüther and H. Bischof Image and Vision Computing, Vol. 30, No. 11, pp. 797-807, 2012.

(R3) Match Graph Construction for Large Image Databases

Kwang In Kim, James Tompkin, Martin Theobald, Jan Kautz, and Christian Theobalt ECCV 2012

(R4) Rotation-Invariant HOG Descriptors Using Fourier Analysis in Polar and Spherical Coordinates

Kun Liu, Henrik Skibbe, Thorsten Schmidt, Thomas Blein, Klaus Palme, Thomas Brox, and Olaf Ronneberger BMVC 2011 and IJCV 2013

(R5) Lightweight Binocular Facial Performance Capture under Uncontrolled Lighting

L. Valgaerts, C. Wu, A. Bruhn, H.-P. Seidel, and C. Theobalt ACM Transactions on Graphics (SIGGRAPH ASIA 2012), Vol. 31, No. 6, 2012

(R6) Videoscapes: Exploring Sparse, Unstructured Video Collections James Tompkin, Kwang In Kim, Jan Kautz, and Christian Theobalt ACM Transactions on Graphics (SIGGRAPH ASIA 2012), Vol. 31, No. 4, 2012

(R7) How Not to Be Seen - Object Removal from Videos of Crowded Scenes

Miguel Granados, James Tompkin, Kwang In Kim, Oliver Grau, Jan Kautz, and Christian Theobalt

ECCV 2012 and Computer Graphics Forum, Vol 31, No. 2, pp. 219-228, 2012.

(R8) Spatio-temporal Motion Tracking with Unsynchronized Cameras

Ahmed Elhayek, Carsten Stoll, Nils Hasler, Kwang In Kim, Hans-Peter Seidel, and Christian Theobalt CVPR 2012

(R9) A Physically-based Approach to Reflection Separation: from Physical Modeling to Constrained Optimization

Naejin Kong, Yu-Wing Tai, and Joseph S. Shin CVPR 2012 and IEEE T-PAMI (accepted)

(R10) Detection of Texture and Isolated Features Using Alternating Morphological Filters

Igor Zingman, Dietmar Saupe, and Karsten Lambers
International Symposium on Math. Morphology and its Applications to Image and Signal Processing (ISMM 2013)

(R11) Efficient Multi-Scale Stereo of High-Resolution Planar and Spherical Images

Alan Brunton, Jochen Lang, and Eric Dubois 3DIMPVT 2012

(R12) Learning Smooth Pooling Regions for Visual Recognition M. Malinowski and M. Fritz BMVC 2013

(R13) Multi-Class Video Co-Segmentation with a Generative Multi-Video Model

Wei-Chen Chiu and Mario Fritz CVPR 2013

(R14) Detection and tracking of occluded people

Siyu Tang, Mykhaylo Andriluka, and Bernt Schiele BMVC 2012

(R15) Script Data for Attribute-based Recognition of Composite Activities

M. Rohrbach, M. Regneri, M. Andriluka, S. Amin, M. Pinkal, and B. Schiele ECCV 2012

(R16) Cross Anisotropic Cost Volume Filtering for Segmentation Vladislav Kramarev, Oliver Demetz, Christopher Schroers, and Joachim Weickert ACCV 2012

(R17) Constrained Fractional Set Programs and Their Application in Local Clustering and Community Detection

Thomas Bühler, Syama Sundar Rangapuram, Simon Setzer, and Matthias Hein ICML 2013

(R18) Seeking the Strongest Rigid Detector

R. Benenson, M. Mathias, T. Tuytelaars, and L. Van Gool CVPR 2013

(R19)	A Reconfigurable Camera Add-on for High Dynamic Range,
	Multi-Spectral, Polarization, and Light-Field Imaging
	Alkhazur Manakov, John F. Restrepo, Oliver Klehm, Ramon Hegedüs,
	Elmar Eisemann, Hans-Peter Seidel, and Ivo Ihrke
	ACM Trans. Graph. (Proc. SIGGRAPH 2013), Vol. 32. No. 4, pp.
	47:1-47:14, 2013.

- (R20) Open Set Lifelong Learning for Visual Recognition Problems
 Alexander Freytag, Paul Bodesheim, Erik Rodner, and Joachim Denzler
 contributions from: CVPR 2013, SCIA 2013, ECCV 2012, ACCV
 2012, ICPR 2012, and BMVC 2012
- (R21) Taking Mobile Multi-Object Tracking to the Next Level: People, Unknown Objects, Carried Items Dennis Mitzel and Bastian Leibe ECCV 2012
- (R22) Towards Scene Understanding with Detailed 3D Object Representations

 Zeeshan Zia, Michael Stark, and Konrad Schindler
- (R23) Higher Order Motion Models and Spectral Clustering
 Peter Ochs and Thomas Brox
 CVPR 2012

CVPR 2013 and IEEE T-PAMI

- (R24) **Discriminative Non-blind Deblurring**Uwe Schmidt, Carsten Rother, Sebastian Nowozin, Jeremy Jancsary,
 and Stefan Roth
 CVPR 2013
- (R25) Modeling Temporal Coherence for Optical Flow Sebastian Volz, Andres Bruhn, Levi Valgaerts, and Henning Zimmer ICCV 2011
- (R26) Lost! Leveraging the Crowd for Prababilistic Visual Self-Localization

 Andreas Geiger, Marcus Brubaker, and Raquel Urtasun

 CVPR 2013

(R27) Poselet Conditioned Pictorial Structures

Leonid Pishchulin, Mykhaylo Andriluka, Peter Gehler, and Bernt Schiele CVPR 2013

(R28) Statistical Analysis of 3D Faces in Motion

Timo Bolkart and Stefanie Wuhrer 3DV (3rd Joint 3DIM/3DPVT Conference) 2013

(R29) Discovering the Structure of a Planar Mirror System from Multiple Observations of a Single Point

Ilya Reshetouski, Alkhazur Manakov, Ayush Bandhari, Ramesh Raskar, Hans-Peter Seidel, and Ivo Ihrke CVPR 2013

(R30) Video Segmentation with Superpixels

Fabio Galasso and Bernt Schiele ACCV 2012

(R31) Object Segmentation by Alignment of Poselet Activations to Image Contours

Thomas Brox, L. Bourdev, S. Maji and J. Malik CVPR 2011

Bus Departure for Conference Dinner

18:45

Location of Departure: Universität Bus Terminal (in front of Campus Entrance East)

The conference dinner is open to all participants with the symbol "D" on the name badge (regular registration). Please remember to wear your name badge and bring your extra dinner tickets in case that you have ordered them.

Conference Dinner at Schloss Halberg

19:00

Location: Franz-Mai-Str. 1, 66121 Saarbrücken Website: http://www.restaurant-schloss-halberg.de/



Schloss Halberg (© Joachim Kirsch)

The conference dinner features a selected buffet in a nice atmosphere.

Bus Departure from Schloss Halberg to City Centre

22:30

The bus will bring you to the Rathausplatz in front of the Rathaus St. Johann. From there you can reach your hotel in the city center by walking or taking a bus. See also Page 11 and your city map.

4.4 Friday, September 6th

Invited Talk 9:00-10:00

Chair: Matthias Hein

Campus E2.2, Günter Hotz Lecture Hall

Extracting Quantitative Models in Molecular Biology

Gene Myers (Max Planck Institute for Molecular Cell Biology and Genetics, Dresden)

Rapid progress in understanding the molecular basis of life is being made now that we can image any genetic agent of interest with a light microscope, and to a lesser degree with electron microscopes. But building quantitatively accurate models from such data is very difficult due to limited resolution and limited signal to noise ratios. While much is being learned by human examination of such imagery, truly successful or even good software for this domain lags far behind what one might think in principle should be possible: the modeling of molecular mechanisms within the cell, modeling of the developmental trajectory of growing organs, and mapping the cellular anatomy of organisms and organs such as a fly brain. This talk is aimed at introducing the audience to this range of problems with examples from my group's work, and illustrating what may be possible in the near future.

Coffee Break 10:00-10:30

Campus E2.2, Lower Ground Floor

Oral Session: Pattern Recognition 10:30-12:15

Chair: Joachim Denzler

Campus E2.2, Günter Hotz Lecture Hall

■ Spatial Pattern Templates for Recognition of Objects with Regular Structure

Radim Tylecek and Radim Sara

K-Smallest Spanning Tree Segmentation Christoph Straehle, Sven Peter, Ullrich Köthe, and Fred Hamprecht

- Discriminable Points that Stick Out of Their Environment
 Dominik Klein and Armin Cremers
- Representation Learning for Cloud Classification

 David Bernecker, Christian Riess, Vincent Christlein, Elli Angelopoulou, and Joachim Hornegger

Lunch Break 12:15-13:30

Campus D4.1, Mensa

Oral Session: Shape Recognition and Scene Understanding

Chair: Juergen Gall 13:30-15:15

Campus E2.2, Günter Hotz Lecture Hall

- CopyMe3D: Scanning and Printing Persons in 3D

 Jürgen Sturm, Erik Bylow, Fredrik Kahl, and Daniel Cremers
- Monocular Pose Capture with a Depth Camera using a Sums-of -Gaussians Body Model

 Daniyar Kurmankhojayev, Nils Hasler, and Christian Theobalt
- Robust Realtime Motion-Split-And-Merge for Motion Segmentation Ralf Dragon, Jörn Ostermann, and Luc Van Gool
- Efficient Multi-Cue Scene Segmentation
 Timo Scharwächter, Markus Enzweiler, Stefan Roth, and Uwe Franke

Coffee Break 15:15-16:00

Campus E2.2, Lower Ground Floor

During the extended coffee break the program committee members will determine the winners of the DAGM awards.

Awards and Closing

16:00-16:15

Campus E2.2, Günter Hotz Lecture Hall

The German Association for Pattern Recognition (DAGM) awards prices for the best scientific contributions to GCPR 2013. The criteria include both the originality and scientific quality of the presentation (talk or poster) during the conference. The prize-winning contribution will be awarded a certificate, a cash prize, and will be mentioned in the proceedings of GCPR 2014 as well as on the web site of the DAGM.

5 GCPR 2014



General Chair

Xiaoyi Jiang University of Münster Münster, Germany

Program Chairs

Joachim Hornegger
University of Erlangen-Nürnberg
Erlangen, Germany
Reinhard Koch
University of Kiel

Kiel, Germany Local Organizing Committee

Gerlinde Siekaup Dimitri Berh Michael Fieseler Benjamin Risse Michael Schmeing Sönke Schmid Kathrin Ungru

Conference website:

http://cvpr.unimuenster.de/GCPR2014/

Inquiries:

gcpr14@uni-muenster.de

Call for Papers

The 36th German Conference on Pattern Recognition (GCPR 2014, formerly DAGM Symposium)

September 2-5, 2014, Münster, Germany

Scope:

GCPR 2014 is the 36th annual symposium of the German Association for Pattern Recognition (DAGM, www.dagm.de). This conference series was among the oldest and largest domestic conferences on pattern recognition, machine learning, image processing, and computer vision. The conference language is English. To reflect the internationalization of the annual DAGM symposia in the past years, the former name "DAGM symposium" has been changed to German Conference on Pattern Recognition (GCPR) in 2013.

The conference addresses recent advances in theory, methodology, and applications of pattern recognition. Authors are invited to submit high-quality papers presenting previously unpublished work. Submitted papers will be reviewed based on the criteria of originality, soundness, empirical evaluation, and presentation. In the long tradition of this conference series, the single track program and poster sessions will provide ample opportunity for open-minded discussions and interaction. The conference will also include tutorials, workshops, and a Young Researchers' Forum.

The scope of GCPR 2014 includes, but is not limited to, the following topics:

- Image processing, analysis, and computer vision
- Machine learning and pattern recognition
- Mathematical foundations, statistical data analysis and models
- Computational photography and confluence of vision and graphics
- · Biomedical image processing and analysis
- Applications

Publication:

Papers must be formatted in the LNCS format. Paper submission instructions can be found at the conference website. All manuscripts will be subject to a double-blind review process. The conference proceedings are planned to be published in the Springer LNCS series. The best contributions will receive GCPR awards.

Important dates (tentative):

Paper submission: May 11, 2014 Author notification: July 7, 2014 Final manuscript due: July 27, 2014





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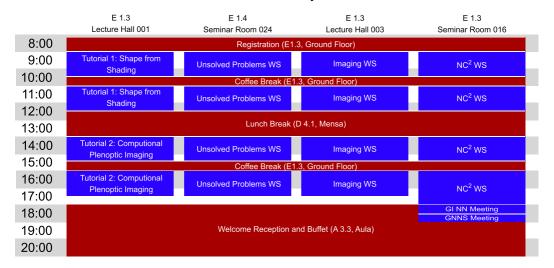




Notes

Conference at a Glance:

Workshops and Tutorials Tuesday



Main Conference

