

9th IAPR - TC15 Workshop on

Graph-based Representations in Pattern Recognition

May 15 - 17, 2013

Vienna, Austria



**TC15
GbR 2013**



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9th IAPR – TC15 Workshop on Graph-based Representations in Pattern Recognition

May 15 – 17, 2013

Vienna, Austria

Hosted by:

Pattern Recognition and Image Processing Group

Vienna University of Technology, Austria

PRIP Club

In Cooperation with:



Sponsored by:



TECHNISCHE
UNIVERSITÄT
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Vienna University of Technology

Organization

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Walter G. Kropatsch	Vienna University of Technology, Austria
Nicole M. Artner	Vienna University of Technology, Austria
Yll Haxhimusa	Vienna University of Technology, Austria
Xiaoyi Jiang	University of Münster, Germany

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Local Organizing Committee

Walter Kropatsch
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 Yll Haxhimusa
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IAPR Distinguished Speakers

Maria Vento

University of Salerno (Italy)

Title of invited talk:

*“A one hour trip in the world of graphs,
looking at the papers of the last ten years”*



Short bio: Mario Vento is a fellow scientist of the International Association Pattern Recognition (IAPR). Currently he is Full Professor of Computer Science and Artificial Intelligence at the University of Salerno (Italy), where he is the coordinator of the Artificial Vision Lab. From 2002 to 2006 he served as chairman of IAPR Technical Committee TC15 on "Graph Based Representation in Pattern Recognition", and from 2003 as associate editor of the "Electronic Letters on Computer Vision and Image Analysis". His research interests fall in the areas of Artificial Intelligence, Image Analysis, Pattern Recognition, Machine Learning and Computer Vision. More specifically, his research activity covered Real time Video analysis and interpretation for traffic monitoring and video surveillance applications, Classification Techniques, either Statistical, Syntactic and Structural, Exact and Inexact Graph Matching, Multi-Expert Classification and Learning Methodologies for Structural Descriptions. He authored over 170 research papers in International Journals and Conference Proceedings and serves as referee for many relevant journals in the field of Pattern Recognition and Machine Intelligence.

Information and picture taken from: <http://mivia.unisa.it/people/vento/>

Herbert Edelsbrunner

Institute of Science and Technology Austria
Duke University (USA)

Title of invited talk:

“Persistent Homology in Image Processing”



Short bio: Herbert Edelsbrunner is currently a Professor at the Institute of Science and Technology Austria and a Professor of Mathematics and Computer Science at Duke University. Furthermore, he is Principal and Director of geomagic, which he co-founded in April 1996. The core of Herbert Edelsbrunnners' research is a combination of mathematics and computer science, always driven by relevant questions in applications. During a past shift from geometry to topology (which are related subjects without clear separation), the group noticed an increase in relevant application questions we could address. These include questions in scientific visualization, structural molecular biology, systems biology, but also geometry processing, medical imaging, and orthodontics. The common theme is the importance of shape and the recognition, matching, and classification of shape. Topology is the area within mathematics whose methods most directly speak to that need. Algorithms and computer software are needed to make mathematical insights useful in applications, which is the motivation to study in topology and also geometry from a computational point of view.

Information and picture taken from: <http://ist.ac.at/en/research/research-groups/edelsbrunner-group/> and <http://pub.ist.ac.at/~edels/>

GbR2013 at a glance

Wednesday, May 15th

08:30	Registration
09:00	Welcome
09:30	Invited speaker 1: Mario Vento
10:30	Coffee Break
11:00	Session 1: Finding Subregions in Graphs
12:20	Lunch
14:30	Session 2: Graph Matching
16:10	Coffee Break
16:40	Session 3: Classification
17:30	TC10
18:30	Walk, Get-Together

Thursday, May 16th

08:30	Session 4: Graph Kernels
10:10	Coffee Break
10:40	Session 5: Properties of Graphs
12:20	Lunch
14:30	Invited speaker 2: Herbert Edelsbrunner
15:30	Session 6: Topology
15:55	Coffee Break
17:30	Talk: Donald E. Knuth (Optional)
19:00	Workshop Dinner

Friday, May 17th

08:30	Session 7: Graph Representations, Segmentation and Shape
10:10	Coffee Break
10:30	Session 8: Sets of Graphs
11:20	TC15 Meeting, GbR 2015
12:20	Lunch

GbR 2013 detailed program

Remark: For your convenience the ordering of the papers in this program is equal to the ordering of the papers in the proceedings. Additionally, the number in brackets below the starting time of each presentation indicates the page number in the proceedings.

Wednesday, May 15th

08:30 Registration

09:00 Welcome

09:30 *[Invited Talk] A one hour trip in the world of graphs, looking at
(1) the papers of the last ten years*

Invited speaker 1: Mario Vento, Chair: Yll Haxhimusa

10:30 Coffee Break

Session 1: Finding Subregions in Graphs

Chair: Edwin Hancock

11:00 *A Unified Framework for Strengthening Topological Node
(11) Features and its Application to Subgraph Isomorphism
Detection*

Nicholas Dahm, Horst Bunke, Terry Caelli, Yongsheng Gao

11:25 *On the complexity of Submap Isomorphism*

(21) Christine Solnon, Guillaume Damiand, Colin De La Higuera, Jean-Christophe Janodet

11:50 *Flooding edge weighted graphs*

(31) Fernand Meyer

12:20 Lunch

Session 2: Graph Matching

Chair: Kaspar Riesen

14:30 (41)	<i>Graph Matching with Nonnegative Sparse Model</i> Bo Jiang, Jin Tang, Bin Luo
<hr/>	
14:55 (51)	<i>TurboTensors for Entropic Image Comparison</i> Francisco Escolano, Edwin Hancock, Boyan Bonev, Miguel Angel Lozano
<hr/>	
15:20 (61)	<i>Active-Learning Query Strategies applied to select a Graph Node given a Graph Labelling</i> Xavier Cortés, Francesc Serratosa
<hr/>	
15:45 (71)	<i>GMTE: A Tool for Graph for Transformation and Exact/Inexact Graph Matching</i> Mohamed Amine Hannachi, Ismael Bouassida Rodriguez, Khalil Drira, Saul Eduardo Pomares Hernandez
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16:10	Coffee Break

Session 3: Classification

Chair: Francisco Escolano

16:40 (81)	<i>A Comparison of Explicit and Implicit Graph Embedding Methods for Pattern Recognition</i> Donatello Conte, Jean-Yves Ramel, Nicolas Sidere, Muhammad Muzzamil Luqman, Benoit Gaüzère, Jaume Gibert, Luc Brun, Mario Vento
<hr/>	
17:05 (91)	<i>Adjunctions on the lattice of dendrograms</i> Fernand Meyer
<hr/>	
17:30	<i>Relevance of graph-based representations in document analysis and recognition</i> TC 10, Josep Lladós Canet
18:30	Walk, Get-Together

Thursday, May 16th

Session 4: Graph Kernels

Chair: Luo Bin

08:30 *A Continuous-Time Quantum Walk Kernel for Unattributed
(101) Graphs*
Luca Rossi, Andrea Torsello, Edwin Hancock

08:55 *Relevant Cycle Hypergraph Representation for Molecules
(111) Benoit Gaüzère, Luc Brun, Didier Villemin*

09:20 *A Quantum Jensen-Shannon Graph Kernel using the
(121) Continuous-Time Quantum Walk*
Lu Bai, Edwin Hancock, Andrea Torsello, Luca Rossi

09:45 *Treelet Kernel Incorporating Chiral Information
(132) Pierre-Anthony Grenier, Luc Brun, Didier Villemin*

10:10 Coffee Break

Session 5: Properties of Graphs

Chair: Luc Brun

10:40 *A Novel Software Toolkit for Graph Edit Distance Computation
(142) Kaspar Riesen, Sandro Emmenegger, Horst Bunke*

11:05 *Map Edit Distance vs Graph Edit Distance for Matching Images
(152) Camille Combier, Guillaume Damiand, Christine Solnon*

11:30 *An Algorithm for Maximum Common Subgraph of Planar
(162) Triangulation Graphs*
Yao Lu, Horst Bunke, Cheng-Lin Liu

11:55 *Graph Characteristics from the Schrödinger Operator
(172) Pablo Suau, Edwin Hancock, Francisco Escolano*

12:20 Lunch

Session 6: Topology

Chair: Walter G. Kropatsch

14:30 (182)	<i>[Invited Talk] Persistent Homology in Image Processing</i> Invited speaker 2: Herbert Edelsbrunner
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15:30 (184)	<i>Towards Minimal Barcodes</i> Rocio Gonzalez-Diaz, Maria-Jose Jimenez, Hamid Krim
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15:55	Coffee Break
17:30	<i>All questions answered</i> Talk of Donald E. Knuth (Optional) Lecture Hall EI 7, Gußhausstraße 27 – 29, ground floor
19:00	Workshop Dinner

Friday, May 17th

Session 7: Graph Representations, Segmentation and Shape

Chair: Xiaoyi Jiang

08:30 *A Fast Matching Algorithm for Graph-Based Handwriting
Recognition*
(194) Andreas Fischer, Ching Y. Suen, Volkmar Frinken, Kaspar Riesen,
Horst Bunke

08:55 *On the Evaluation of Graph Centrality for Shape Matching*
(204) Samuel de Sousa, Nicole Artner, Walter Kropatsch

09:20 *Shape recognition as a constraint satisfaction problem*
(214) Aline Deruyver, Yann Hodé

09:45 *Gaussian Wave Packet on a Graph*
(224) Furqan Aziz, Richard Wilson, Edwin Hancock

10:10 Coffee Break

Session 8: Sets of Graphs

Chair: Andrea Torsello

10:30 *Exact Computation of Median Surfaces Using Optimal 3D
Graph Search*
(234) Zhengwang Wu, Xiaoyi Jiang, Nanning Zheng, Yuehu Liu, Da-
Chuan Cheng

10:55 *Estimation of Distribution Algorithm for the Max-Cut Problem*
(244) Samuel de Sousa, Yll Haxhimusa, Walter Kropatsch

11:20 TC15 Meeting, GbR 2015

12:20 Lunch

Lunch Menu

*Please choose between meat and vegetarian dish for each day. You will receive coupons for your selected menus at the **registration desk**. Each lunch **additionally includes** daily soup and one beverage.*

Wednesday, May 15th

Menu 1 (meat)

“Viennese Schnitzel” breaded turkey escalopeserved with potato salad

Menu 2 (vegetarian)

Potato pancake “Bohemian Style” with sour cream

Thursday, May 16th

Menu 1 (meat)

Beef goulash with butter dumplings

Menu 2 (vegetarian)

Homemade spinach pie with feta cheese and sour cream

Friday, May 17th

Menu 1 (meat)

Pig roast with bacon coleslaw and potato dumplings

Menu 2 (vegetarian)

Baked Emmentaler cheese served with tartar and salad garnishes

Dinner Menu

*You have the choice between menu 1 (meat), menu 2 (fish) and menu 3 (vegetarian). A dinner coupon will be given to you at the **registration desk**.*

Menu 1

Chilled cucumber soup with smoked salmon and crostinis

*Steak of lamb with a crust of dijon mustard
and parsley on potato goulash with lamb salami*

Gratinated curd pancakes with vanilla sabayon and ice cream

Menu 2

Chilled cucumber soup with smoked salmon and crostinis

*Filet of catfish with stewed tomatoes, olives, capers and lemon sauce,
served with salt potatoes*

Yoghurt-raspberry mousse with chocolate blinis and rice ice cream

Menu 3

Deep fried sheep cheese dumplings on salad of asparagus

Goulash of chanterelles with potato strudel

Gratinated curd pancakes with vanilla sabayon and ice cream

Important Locations



Festsaal

Location of workshop,
Karlsplatz 13
TU-Wien, Hauptgebäude
1. Floor (Stock)
Staircase (Stiege) I

Wieden Bräu

Lunch
Waaggasse 5

Entler

Workshop dinner
Schlüsselgasse 2

Lecture hall EI 7

Talk of Donald E. Knuth
Ground floor
Gußhausstrasse 27-29

All locations of our
workshop are located
in the 4th district of
Vienna (1040).

Festsaal, Karlsplatz 13, building map

1. Floor
(Obergeschoß)

Festsaal

Ground floor
Erdgeschoß

