Selected Chapters organized by

Walter G. Kropatsch
Institute of Computer Graphics and Algorithms 186/3
Pattern Recognition and Image Processing Group
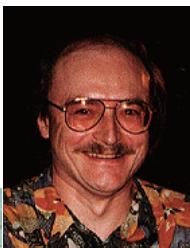
Selected Chapters started in 2002

SS 2002 AKdTI5: Walter Kropatsch: Anwendungen von Bildpyramiden
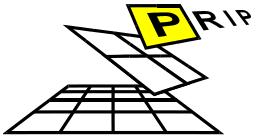
Selected Chapters 2003-2008

SS 2003(BV): Walter Kropatsch: BILDPYRAMIDEN + GRAPHEN

WS 2003(ME): P. Lienhardt (Poitiers): Fundamentals of Topology-based Geometric Modeling.

SS 2004(BV): Wolfgang Förstner (Bonn): Projektive Geometrie

WS 2004(ME): Walter Kropatsch: Cognitive Vision

SS 2005(BV): Walter Kropatsch: Repräsentationen in der Bildanalyse

WS 2005(ME): Nicu Sebe (Amsterdam): Multimedia Information Systems

**WS 2006(ME):** Samuel Peltier (Poitiers): Homology Groups (canceled)

SS 2007(BV): Eric Andres (Poitiers): discrete Geometry

WS 2007(ME): Walter Kropatsch: GRAPHS + Pyramids

SS 2008(BV): R. Gonzalez-Diaz (Sevilla): Extracting Topological Information of 3D Digital Images

WS 2008(ME): Kropatsch, Helena Molina (Sevilla): Pyramids + Topology

PRIP-LV
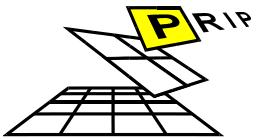
Selected Chapters 2009-2013

SS 2009(BV): Pedro Real Jurado (Sevilla): Computing "holes" of 3D digital objects

WS 2009(ME): Luc Brun (Caen): Partition encoding: Geometrical and topological challenges

SS 2010(BV): Walter Kropatsch: We are building a Topological Pyramid
and Rocio Gonzalez-Diaz (Sevilla): (Co-)Homology Groups of 3D binary images

WS 2010(ME): Kropatsch, Vucini, Chao Chen: Pyramids + Topology

**SS 2011(BV):** Horst Bunke (Bern): Basic Methodology and Recent Developments in Structural Pattern Recognition

WS 2011(ME): Claudia Landi (Reggio Emilia, I): Shape-from-function methods

SS 2012(BV): Max Göbel and Walter Kropatsch: Object Detection/Recognition from 2D images

WS 2012(ME): KSFu Lecture Series: Pavlidis, Aggarwal, Huang, Kittler, Jain, Bunke

**SS 2013(BV):** Walter Kropatsch, GbR2013: Graph-based Representations in PR

WS 2013(ME): KSFu Lecture Series: Pavlidis, Aggarwal, Huang, Kittler, Jain, Bunke, Chellappa
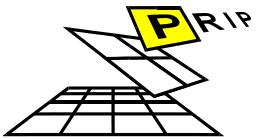
Selected Chapters 2014–

SS 2014(BV): W. Kropatsch, Thomas Druml (VetMed), Wolfgang Busch (GMI): Image-based Phenotyping

WS 2014(ME): Walter Kropatsch: Selection of KSFu and BMVC Lectures

SS 2015(BV): Laszlo Nyul: Fuzzy techniques in image processing

WS 2015(ME): Walter Kropatsch, Nicole Artner, Ines Janusch, Aysylu Gabdulkhakova: Selection of PRIP research topics 2015/16

SS 2016(BV): Walter Kropatsch: Graphs: Matching and Distance

WS 2016(ME): Walter Kropatsch, Ines Janusch: Skeletonization and its Applications

SS 2017(BV): Raphael Barth, Ines Janusch, Walter Kropatsch: 360^0 Vision

**WS 2017(ME):** Walter Kropatsch: Recognizing Plants & Animals

Ausgewählte Kapitel der Mustererkennung (AKME) Selected Chapters in Pattern Recognition (183.111, 2VU)

WS 2017: **Recognizing Plants and Animals**

- 1st lecture: 3.10.2015 16:00ct

- Meetings: 17., 31. October,

- Presentations: 7., 14., 21., 28. November; 5.,12. December 2017, 9., 16., 23. January 2018

- Where: Besprechungsraum 186,Favoritenstr.9-11, 5th floor.
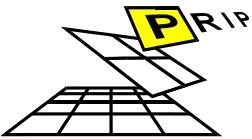
Topic 2017/18: Recognizing Plants and Animals

Plants, Leaves, Roots, Horses, Worms, Birds.

Your tasks:

1. Select one particular (sub-)problem from the above research topics;

2. choose a date for presentation;
   (2017: Nov. 7, 14, 21, 28; Dec.5, 12; 2018 Jan.9, 16, 23)

3. work out a solution/proposal for the selected problem;

4. present your solution (evt. in consistent parts);

5. write a report on your results.

6. Select and prepare critical questions/remarks for another topic as opponent; and

7. write a short report on the discussion of a third topic.

PRIP-LV

Walter G. Kropatsch   TU-Wien 186/3

Pattern Recognition and Image Processing Group

Current research questions

Project proposal Impulse Iran-Austria
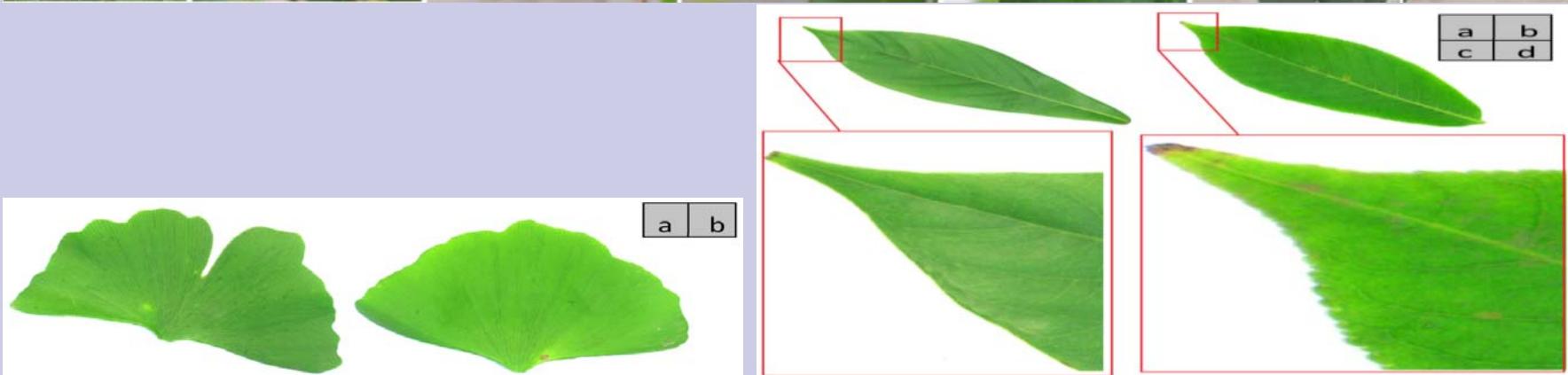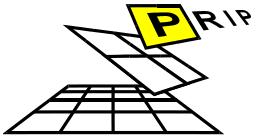
Further Sources

Further Sources

1. Data Sets:
   https://www.plant-phenotyping.org/datasets-home
   http://www.plant-image-analysis.org/software/leaf-recognition

2. Workshops:
   VAIB http://homepages.inf.ed.ac.uk/rbf/vaib16.html
   CVPPP https://www.plant-phenotyping.org/CVPPP2017,
   https://www.plant-phenotyping.org/CVPPP2014

3. Special Issues:
   http://homepages.inf.ed.ac.uk/rbf/VAIB16PAPERS/IETCFPCVABIOv3.pdf
   https://www.springeropen.com/collections/AIBUIS
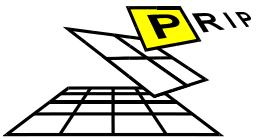
Selected References

Topic	Cites	Speaker, Opponent, Reporter	when
Plants	[12, 4, 6, 2]		
Leaves	[2, 1]		
Roots	[5, 7, 8]		
Horses	[3]		
Worms	[11, 10]		
Birds	[9]		

References

[1] Marco Augustin, Yll Haxhimusa, Wolfgang Busch, and Walter G. Kropatsch. Image-based phenotyping of the mature arabidopsis shoot system. In Sotirios A. Tsaftaris and Hanno Scharr, editors, *ECCV 2014 Workshops, Part IV, Computer Vision Problems in Plant Phenotyping (CVPPP)*, volume LNCS 8928 of *Lecture Notes in Computer Science*, pages pp. 227–242, Zurich, CH, September 2015. Springer, Berlin Heidelberg.

[2] Marco Augustin, Yll Haxhimusa, Wolfgang Busch, and Walter G. Kropatsch. A framework for the extraction of quantitative traits from 2d images of mature arabidopsis thaliana. *Machine Vision and Applications*, 27(5):pp. 647–661, September 2016.

[3] Thomas Druml, Aysylu Gabdulkhakova, Nicole Artner, Gottfried Brem, and Walter G. Kropatsch. The use of image data in the assessment of equine conformation - limitations and solutions. In Robert B. Fisher, J. Hammal, B. Boom, and Spampinato, editors, *Visual observation and analysis of Vertebrate And Insect Behavior 2014*. Springer, 2014.

[4] Ines Janusch, Nicole M. Artner, and Walter G. Kropatsch. Euclidean and Geodesic Distance Profiles. In Nicole M. Artner, Ines Janusch, Walter G. Kropatsch, and David Coeurjolly, editors, *Proc. of the 20th Intl.Conf. on Discrete Geometry for Computer Imagery 2017*, volume LNCS 10502 of *Lecture Notes in Computer Science*, pages 307–318. Springer International, September 2017.
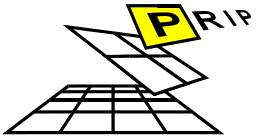
[5] Ines Janusch and Walter G. Kropatsch. Novel concepts for recognition and representation of structure in spatio-temporal classes of images. In Paul Wohlhart and Vincent Lepetit, editors, *Proceedings of the 20th Computer Vision Winter Workshop 2015*, pages 49–56, Seggau, A, February 2015.

[6] Ines Janusch and Walter G. Kropatsch. LBP Scale Space Origins for Shape Classification. In Walter G. Kropatsch Nicole M. Artner, Ines Janusch, editor, *Proceedings of the 22nd Computer Vision Winter Workshop 2017*, pages 1–9, Retz, A, February 2017. TU Wien, PRIP Club. ISBN 978-3-200-04969-7.

[7] Ines Janusch, Walter G. Kropatsch, and Wolfgang Busch. Topological image analysis and (normalised) representations for plant phenotyping. In Darian M. Onchis and Pedro Real Jurado, editors, *Proceedings of the 5th International Workshop on Computational Topology in Image Context, CTIC2014*, Timisoara, Romania, September 2014.

[8] Ines Janusch, Walter G. Kropatsch, Wolfgang Busch, and Daniela Ristova. Representing roots on the basis of reeb graphs in plant phenotyping. In Sotirios A. Tsaftaris and Hanno Scharr, editors, *ECCV 2014 Workshops, Part IV, Computer Vision Problems in Plant Phenotyping (CVPPP)*, volume LNCS 8928 of *Lecture Notes in Computer Science*, pages pp. 71–840, Zurich, CH, September 2015. Springer, Berlin Heidelberg.

[9] Leonardo Oliva, Alessia Saggese, Nicole M. Artner, Walter G. Kropatsch, and Mario Vento. From trajectories to behaviors: an algorithm to track and describe dancing birds. In Walter G. Kropatsch Nicole M. Artner, Ines Janusch, editor, *Proceedings of the 22nd Computer Vision Winter Workshop 2017*, pages 1–9, Retz, A, February 2017. TU Wien, PRIP Club. ISBN 978-3-200-04969-7.

[10] Daniel Pucher, Nicole M. Artner, and Walter G. Kropatsch. 2d tracking of platynereis dumerilii worms during spawning. In Luka Čehovin, Rok Mandeljc, and Vitomir Štruc, editors, *Proceedings of the 21st Computer Vision Winter Workshop 2016*, pages 1–9, Rimske Toplice, Slo, February 2016.

[11] Carmine Sansone, Daniel Pucher, Nicole Artner, Walter G. Kropatsch, Alessia Saggese, and Mario Vento. Shape Normalizing and Tracking Dancing Worms. In Antonio Robles-Kelly, Marco Loog, Battista Biggio, Francisco Escolano, and Richard Wilson, editors, *S+SSPR 2016*, volume LNCS 10029 of *Lecture Notes in Computer Science*, pages 390–400. Springer International, November 2016.

[12] Jana Wäldchen and Patrick Mäder. Plant Species Identification Using Computer Vision Techniques: A Systematic Literature Review. *Archives of Computational Methods in Engineering*, pages 1–37, 2017.