CURRICULUM VITAE

ROLAND KWITT

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Birth Date March 19, 1982 Citizenship Austrian

Academic Details h-index: 21, Cites: 1399 (Source: Google Scholar, Jan. 2019)

CURRENT EMPLOYMENT

2017-today University of Salzburg

Associate Professor

Department of Computer Science

Jakob-Haringer Str. 2, A-5020 Salzburg, Austria

Phone: +43 (0) 662 8044-6311

2013–2017 University of Salzburg

Assistant Professor

Department of Computer Science

Jakob-Haringer Str. 2, A-5020 Salzburg, Austria

PREVIOUS EMPLOYERS

2011-2013 Kitware Inc.

R & D Engineer, Computer Vision / Medical Imaging Group

101 E Weaver St., NC 27510, USA

Supervisor(s): Stephen Aylward, Brad Davis

EDUCATION

2010-2011	PostDoc, CS department	., University of Salzburg	(ADVISOR(S): Andreas I	Jhl, Wolfgang Pree)

2007-2010 Dr. techn. (equiv. to PhD), CS department, University of Salzburg (ADVISOR: Andreas Uhl)

2005-2007 Dipl.-Ing. (equiv. to MsC), CS department, University of Salzburg (ADVISOR: Ulrich Hofman)

2001-2005 Dipl.-Ing. (FH) (equiv. MsC), Telecommunications Engineering, University of Applied Sciences Salzburg

(ADVISOR: Ulrich Hofman)

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AWARDS

2012

2005

2014 CVPR '14 Outstanding Reviewer

Short-listed for the "Heinz-Zemanek" price 2012 (notification e-mail upon request)

MICCAI '12 Young Investigator Award, awarded at MICCAI '12 (Nice, France)

2007 Best Paper Award, International Conference on Computer Recognition Systems (CORES '07)

Special Appreciation Award, Austrian Ministry of Science and Research

MAIN RESEARCH AREAS

Machine learning, Computer vision & Medical image analysis

FUNDING & PROJECTS

2018-2019 Data Analytics in Industrial Environments

(together with Assoc.-Prof. Dr. Wolfgang Trutschnig, Department of Mathematics, University of Salzburg)

Industrial partner: Siemens Austria Funding amount: € 20,000.-

2018 Synonym Analysis for Improving Search Queries

(together with Prof. Dr. Nikolaus Augsten, CS Department, University of Salzburg)

Industrial partner: FindoLogic GmbH

Funding amount: € 5,000.- (FFG Innovationsscheck 5,000)

STUDENT SUPERVISION

PRIMARY PHD ADVISOR

• Christoph D. Hofer (ongoing)

SECONDARY PHD ADVISOR

- Debiasi Luca (ongoing)
- González Tejeda Yansel (ongoing)
- Höller Yvonne (ongoing)
- Schraml Rudolf (ongoing)
- Ribeiro Eduardo (completed)
- Mann Willi (completed, now at Celonis)
- Wimmer Georg (completed, now PostDoc at Univ. of Salzburg)
- Kauba Christof (completed, now PostDoc at Univ. of Salzburg)

MSC ADVISOR

- Söllinger Dominik (ongoing)
- Peer Raphael (ongoing)
- Grafendorfer Philipp (ongoing)
- Johanna Wald (completed, now at TU Munich)

Publications (in reverse-chronological order)

JOURNAL ARTICLES

- [Yan+17] X. Yang, R. Kwitt, M. Styner, and M. Niethammer. "Quicksilver: Fast Predictive Image Registration a Deep Learning Approach". In: *NeuroImage* (2017). Accepted (Preprint available at https://arxiv.org/abs/1703.10908).
- [Hon+16a] Y. Hong, R. Kwitt, N. Singh, N. Vasconcelos, and M. Niethammer. "Parametric Regression on the Grassmannian". In: *IEEE Transactions on Pattern Analysis and Machine Intelligence* 38.11 (Nov. 2016). DOI: 10.1109/TPAMI.2016.2516533.
- [Liu+15a] X. Liu, M. Niehthammer, R. Kwitt, N. Singh, M. McCormick, and S. Aylward. "Low-Rank Atlas Image Analyses in the Presence of Pathologies". In: *IEEE Transactions on Medical Imaging* 34.12 (Dec. 2015), pp. 2583–2591. DOI: 10.1109/TMI.2015.2448556.

- [Hon+14c] Y. Hong, B. Davis, J. S. Marron, R. Kwitt, N. Singh, J. S. Kimbell, E. Pitkina, R. Superfine, S.D. Davis, C. J. Zdanski, and M. Niethammer. "Statistical atlas construction via weighted functional boxplots". In: *Medical Image Analysis* 18.4 (May 2014), pp. 684–698. DOI: 10.1016/j.media.2014.03.001.
- [Kwi+13b] R. Kwitt, N. Vasconcelos, S. Razzaque, and S. Aylward. "Localizing Target Structures in Ultrasound Video A Phantom Study". In: *Medical Image Analysis* 17.7 (Oct. 2013), pp. 712–722. DOI: 10.1016/j.media.2013.05.003.
- [Kwi+12b] R. Kwitt, N. Vasconcelos, N. Rasiwasia, A. Uhl, B. Davis, M. Häfner, and F. Wrba. "Endoscopic Image Analysis in Semantic Space". In: Medical Image Analysis 16.7 (Oct. 2012), pp. 1415–1422. DOI: 10.1016/j.media.2012.04.010.
- [KMU11a] R. Kwitt, P. Meerwald, and A. Uhl. "Efficient Texture Image Retrieval Using Copulas in a Bayesian Framework". In: *IEEE Transactions on Image Processing* 20.7 (July 2011), pp. 2063–2077. DOI: 10.1109/TIP.2011.2108663.
- [KMU11b] R. Kwitt, P. Meerwald, and A. Uhl. "Lightweight Detection of Additive Watermarking in the DWT-Domain". In: *IEEE Transactions on Image Processing* 20.2 (Feb. 2011), pp. 474–484. DOI: 10.1109/TIP.2010.2064327.
- [KU10a] R. Kwitt and A. Uhl. "Lightweight Probabilistic Texture Retrieval". In: *IEEE Transactions on Image Processing* 19.1 (Jan. 2010), pp. 241–253. DOI: 10.1109/TIP.2009.2032313.
- [Haf+09a] M. Häfner, R. Kwitt, A. Uhl, A. Gangl, F. Wrba, and A. Vécsei. "Feature-Extraction from Multi-Directional Multi-Resolution Image Transformations for the Classification of Zoom-Endoscopy Images". In: *Pattern Analysis and Applications* 12.4 (Dec. 2009), pp. 407–413. DOI: 10.1007/s10044-008-0136-8.
- [Haf+08a] M. Häfner, R. Kwitt, A. Uhl, A. Gangl, F. Wrba, and A. Vécsei. "Computer-assisted Pit-Pattern Classification in Different Wavelet Domains for Supporting Dignity Assessment of Colonic Polyps". In: *Pattern Recognition* 42.6 (Sept. 2008), pp. 1180–1191. DOI: doi:10.1016/j.patcog.2008.07.012.

CONFERENCE ARTICLES

- [Liu+18a] B. Liu, M. Dixit, R. Kwitt, and N. Vasconcelos. "Feature Space Transfer for Data Augmentation". In: *CVPR*. 2018.
- [Gre+18] H. Greer, S. Gerber, M. Niethammer, R. Kwitt, M. McCormick, D. Chittajallu, N. Siekierski,
 M. Oetgen, K. Cleary, and S. Aylward. "Scoliosis Screening and Monitoring Using Self
 Contained Ultrasound and Neural Networks". In: ISBI. 2018.
- [Dix+17] M. Dixit, R. Kwitt, M. Niethammer, and N. Vasconcelos. "AGA: Attribute-Guided Augmentation". In: *CVPR*. 2017.
- [Han+17] X. Han, X. Yang, R. Kwitt, and M. Niethammer. "Efficient Registration of Pathological Images: A joint PCA/Image-Reconstruction Approach". In: *ISBI*. 2017.
- [Hof+17a] C. Hofer, R. Kwitt, Y. Höller, E. Trinka, M. Niethammer, and A. Uhl. "Constructing Shape Spaces from a Topological Perspective". In: *IPMI*. 2017.
- [Hof+17b] C. Hofer, R. Kwitt, Y. Höller, E. Trinka, and A. Uhl. "Simple Domain Adaptation for Cross-Dataset Analyses of Brain MRI Data". In: *ISBI*. 2017.
- [Hof+17c] C. Hofer, R. Kwitt, M. Niethammer, and A. Uhl. "Deep Learning with Topological Signatures". In: 2017.
- [Hon+17] Y. Hong, X. Yang, R. Kwitt, M. Styner, and M. Niethammer. "Regression Uncertainty on the Grassmannian". In: *AISTATS*. 2017.
- [Yan+17] X. Yang, R. Kwitt, M. Styner, and M. Niethammer. "Fast Predictive Multimodal Image Registration". In: *ISBI*. 2017.
- [Gad+16a] M. Gadermayr, S. Hegenbart, R. Kwitt, and A. Uhl. "Narrow Band Imaging Versus White-Light: What is best for Computer-Assisted Diagnosis of Celiac Disease?" In: *ISBI*. 2016.
- [KHN16a] R. Kwitt, S. Hegenbart, and M. Niethammer. "One-Shot Learning of Scene Locations via Feature Trajectory Transfer". In: *CVPR*. 2016.

- [Ayl+16a] S. Alyward, M. McCormick, H.J. Kang, S. Razzaque, R. Kwitt, and M. Niethammer. "Ultrasound Spectroscopy". In: *ISBI*. 2016.
- [Yan+16] X. Yang, X. Han, E. Park, S. Aylward, R. Kwitt, and M. Niethammer. "Registration of Pathological Images". In: *Proceedings of the MICCAI Workshop on Simulation and Synthesis in Medical Imaging*. 2016.
- [YKN16] X. Yang, R. Kwitt, and M. Niethammer. "Fast Predictive Image Registration". In: *Proceedings of the MICCAI Workshop on Deep Learning in Medical Image Analysis*. 2016.
- [Kwi+15a] R. Kwitt, S. Huber, M. Niethammer, W. Lin, and U. Bauer. "Statistical Topological Data Analysis A Kernel Perspective". In: NIPS. 2015. URL: http://goo.gl/GAz8s0.
- [Rei+15a] R. Reininghaus, U. Bauer, S. Huber, and R. Kwitt. "A Stable Multi-scale Kernel for Topological Machine Learning". In: *CVPR*. 2015. DOI: 10.1109/CVPR.2015.7299106.
- [Hon+15a] Y. Hong, N. Singh, R. Kwitt, and M. Niethammer. "Group Testing for Longitudinal Data". In: *IPMI*. 2015. DOI: 10.1007/978-3-319-19992-4_11.
- [HKN15a] Y. Hong, R. Kwitt, and M. Niethammer. "Model Criticism for Regression on the Grassmannian". In: *MICCAI*. 2015. DOI: 10.1007/978-3-319-24574-4_87.
- [Hon+14a] Y. Hong, N. Singh, R. Kwitt, and M. Niethammer. "Time-warped Geodesic Regression". In: *MICCAI*. 2014. DOI: 10.1007/978-3-319-10470-6_14.
- [Kwi+14a] R. Kwitt, S. Razzaque, J. Lowell, and S. Aylward. "Variability sensitivity of dynamic texture based recognition in clinical CT data". In: *SPIE Medical Imaging*. 2014. DOI: 10.1117/12. 2043271.
- [Liu+14a] X. Liu, M. Niethammer, R. Kwitt, M. McCormick, and S. Aylward. "Low-Rank to the Rescue: Atlas-based Analyses in the Presence of Pathologies". In: *MICCAI*. 2014. DOI: 10. 1007/978-3-319-10443-0_13.
- [Heg+14a] S. Hegenbart, R. Kwitt, N. Rasiwasia, A. Vécsei, and A. Uhl. "Do We need Annotation Experts? A Case Study in Celiac Disease Classification". In: *MICCAI*. 2014. DOI: 10.1007/978-3-319-10470-6_57.
- [Hon+14b] Y. Hong, R. Kwitt, N. Singh, B. Davis, and M. Niethammer. "Geodesic Regression on the Grassmannian". In: *ECCV*. 2014. DOI: 10.1007/978-3-319-10605-2_41.
- [Hon+13a] Y. Hong, B. Davis, J.S. Marron, R. Kwitt, and M. Niethammer. "Weighted Functional Boxplot with Application to Statistical Atlas Construction". In: *MICCAI*. 2013. DOI: 10.1007/978-3-642-40760-4_73.
- [Kwi+13a] R. Kwitt, D. Pace, M. Niethammer, and S. Aylward. "Studying Cerebral Vasculature Using Structure Proximity and Graph Kernels". In: *MICCAI*. 2013. DOI: 10.1007/978-3-642-40763-5_66.
- [KVR12a] R. Kwitt, N. Vasconcelos, and N. Rasiwasia. "Scene Recognition on the Semantic Manifold". In: ECCV. 2012. DOI: 10.1007/978-3-642-33765-9_26.
- [Kwi+12a] R. Kwitt, N. Vasconcelos, S. Razzaque, and S. Alyward. "Recognition in Ultrasound Videos: Where Am I?" In: *MICCAI*. 2012. DOI: 10.1007/978-3-642-33454-2_11.
- [Gsc+11a] M. Gschwandtner, R. Kwitt, W. Pree, and A. Uhl. "Infrared Camera Calibration for Dense Depth Map Construction". In: *IV*. 2011. DOI: 10.1109/IVS.2011.5940515.
- [GKU11a] M. Gschwandtner, R. Kwitt, and A. Uhl. "BlenSor: Blender Sensor Simulation Toolbox". In: *ISVC*. 2011. DOI: 10.1007/978-3-642-24031-7_20.
- [Kwi+11b] R. Kwitt, P. Meerwald, A. Uhl, and G. Verdoolaege. "Testing a Multivariate Model for Wavelet Coefficients". In: *ICIP*. 2011. DOI: 10.1109/ICIP.2011.6115667.
- [Kwi+11a] R. Kwitt, N. Rasiwasia, N. Vasconcelos, A. Uhl, M. Häfner, and F. Wrba. "Learning Pit Pattern Concepts for Gastroenterological Training". In: *MICCAI*. 2011. DOI: 10.1007/978-3-642-23626-6_35.
- [Hub+10a] S. Huber, R. Kwitt, P. Meerwald, M. Held, and A. Uhl. "Watermarking of 2D Vector Graphics with Distortion Constraint". In: *ICME*. 2010. DOI: 10.1109/ICME.2010.5583049.
- [Kwi+10a] R. Kwitt, A. Uhl, M. Häfner, A. Gangl, F. Wrba, and A. Vécsei. "Predicting the Histology of Colorectal Lesions in a Probabilistic Framework". In: *MMBIA*. 2010. DOI: 10.1109/CVPRW. 2010.5543146.

- [Haf+09b] M. Häfner, A. Gangl, R. Kwitt, A. Uhl, A. Vécsei, and F. Wrba. "Improving Pit-Pattern Classification of Endoscopy Images by a Combination of Experts". In: *MICCAI*. 2009. DOI: 10.1007/978-3-642-04268-3_31.
- [Heg+09c] S. Hegenbart, R. Kwitt, M. Liedlgruber, A. Uhl, and A. Vécsei. "Impact of Duodenal Image Capturing Techniques and Duodenal Regions on the Performance of Automated Diagnosis of Celiac Disease". In: *ISPA*. 2009. DOI: 10.1109/ISPA.2009.5297637.
- [KMU09d] R. Kwitt, P. Meerwald, and A. Uhl. "A Joint Model of Complex Wavelet Coefficients for Texture Retrieval". In: *ICIP*. 2009. DOI: 10.1109/ICIP.2009.5413656.
- [KMU09c] R. Kwitt, P. Meerwald, and A. Uhl. "Efficient Detection of Additive Watermarking in the DWT-Domain". In: *EUSIPCO*. 2009. URL: http://goo.gl/lS4clA.
- [KMU09b] R. Kwitt, P. Meerwald, and A. Uhl. "Blind DT-CWT Domain Additive Spread-Spectrum Watermark Detection". In: *DSP*. 2009. DOI: 10.1109/ICDSP.2009.5201255.
- [KMU09a] R. Kwitt, P. Meerwald, and A. Uhl. "Color-Image Watermarking using Multivariate Power-Exponential Distribution". In: *ICIP*. 2009. DOI: 10.1109/ICIP.2009.5413715.
- [Haf+08b] M. Häfner, R. Kwitt, F. Wrba, A. Gangl, A. Vécsei, and A. Uhl. "One-Against-One Classification for Zoom-Endoscopy Images". In: *MEDSIP*. 2008. DOI: 10.1049/cp:20080453.
- [KU08b] R. Kwitt and A. Uhl. "Color Eigen-Subband Features for Endoscopy Image Classification". In: ICASSP. 2008. DOI: 10.1109/ICASSP.2008.4517678.
- [KU08a] R. Kwitt and A. Uhl. "Image Similarity Measurement by Kullback-Leibler Divergences between Complex Wavelet Subband Statistics for Texture Retrieval". In: *ICIP*. 2008. DOI: 10.1109/ICIP.2008.4711909.
- [KU07a] R. Kwitt and A. Uhl. "Modeling the Marginal Distributions of Complex Wavelet Coefficient Magnitudes for the Classification of Zoom-Endoscopy Images". In: *MMBIA*. 2007. DOI: 10.1109/ICCV.2007.4409170.

THESES

[Kwitt10a] R. Kwitt. "Statistical Modeling in the Wavelet Domain and Applications". PhD thesis. Department of Computer Science, University of Salzburg, Austria, 2010.

CONFERENCE TALKS & PRESENTATIONS

- 06/2016 One-Shot Learning of Scene Locations via Feature Trajectory Transfer, CVPR '16, Las Vegas, USA
- 12/2015 Statistical Topological Data Analysis A Kernel Perspective, NIPS '15, Montreal, Canada
- 10/2015 Model Criticism for Regression on the Grassmannian, MICCAI '15, Munich, Germany
- 06/2015 A Stable Multi-Scale Kernel for Topological Machine Learning, CVPR '15, Boston, USA
- 09/2014 Geodesic Regression on the Grassmannian, ECCV '14, Zurich, Switzerland
- 09/2014 Do we need Annotation Experts A Case Study in Celiac Disease Classification, MICCAI '14, Boston, USA
- 09/2014 Low-Rank to the Rescue Atlas-based Analyses in the Presence of Pathologies, MICCAI '14, Boston, USA
- 10/2013 Studying Cerebral Vasculature Using Structure Proximity and Graph Kernels, MICCAI '13, Nagoya, Japan
- Scene Recognition on the Semantic Manifold, ECCV '12, Florence, Italy
- 10/2012 Recognition in US Video: Where Am I?, MICCAI '12, Nice, France
- 09/2011 Learning Pit Pattern Concepts for Gastroenterological Training, MICCAI '11, Toronto, Canada
- 08/2010 Statistical Modeling in the Wavelet Domain and Applications, PhD defense, Salzburg, Austria
- 11/2009 A Joint Model of Complex Wavelet Coefficients for Texture Retrieval, ICIP '09, Cairo, Egypt
- 11/2009 Color-Image Watermarking using Multivariate Power-Exponential Distribution, ICIP '09, Cairo, Egypt
- 09/2009 Improving Pit Pattern Classification by a Combination of Experts, MICCAI '09, London, UK
- 10/2008 Image Similarity Measurement by Kullback-Leibler Divergences between Complex Wavelet Subband Statistics for Texture Retrieval, ICIP '08, San Diego, CA, USA
- 04/2008 Color Eigen-Subband Features for Endoscopy Image Classification, ICASSP '08, Las Vegas, NV, USA
- Modeling the Marginal Distributions of Complex Wavelet Coefficient Magnitudes for the Classification of Zoom-Endoscopy Images, MMBIA '07, Rio de Janeiro, Brazil

INVITED TALKS

01/2018	Machine Learning with Topological Signatures
	Oberwolfach Workshop "Statistics for Data with Geometric Structure", Oberwolfach, Germany
04/2016	Low rank to the Rescue: Atlas-based Analyses in the Presence of Pathologies
	"Images and Networks of the Brain", Hamburg, Germany (invited by R. Werner)
07/2015	Topological Machine Learning
	ISNPS '15, Graz Austria (invited by J.S. Marron)
04/2014	Grassmannian Geodesic Regression
	IST Austria, Austria (invited by Edelsbrunner group)
06/2013	Localizing Target Structures In Ultrasound Videos
	Quantitative Medical Imaging (QMI), Arlington, VA, USA
12/2012	Scene Recognition on the Semantic Manifold
	SVCL, UC San Diego, USA (invited by N. Vasconcelos)
10/2012	Recognition in US Video: Where Am I? UNC. Chapel Hill (Computer Science), NC. USA

TEACHING

Winter '18	Seminar Multimedia Technologies (graduate level, with A. Uhl), University of Salzburg
Winter '18	Computer Vision (graduate level), University of Salzburg
Winter '18	Introduction to Data Science (graduate level; within MSc Program in Data Science)
Winter '18	Case Studies (graduate level; within MSc Program in Data Science)
Winter '18	BSc Seminar (undergraduate level)
Summer '17	Machine Learning (graduate level), University of Salzburg
Summer '17	Databases 1 (undergraduate level), University of Salzburg
Summer '17	Databases 1 – Proseminar (undergraduate level), University of Salzburg
Summer '17	Seminar Multimedia Technologies (graduate level, with A. Uhl), University of Salzburg
Winter '16	Seminar Multimedia Technologies (graduate level, with A. Uhl), University of Salzburg
W inter '16	Computer Vision (graduate level), University of Salzburg
Winter '16	Computer Science for Everyone (undergraduate level), University of Salzburg
Winter '16	Introduction to Data Science (graduate level, together with A. Bathke), University of Salzburg
Summer '16	Seminar Multimedia Technologies (graduate level, with A. Uhl), University of Salzburg
Summer '16	Databases 1 – Proseminar (undergraduate level), University of Salzburg
Summer '16	Imaging Beyond Consumer Cameras (graduate level), University of Salzburg
Winter '16	Seminar Multimedia Technologies (graduate level, with A. Uhl), University of Salzburg
Winter '16	Advanced Image Processing & Computer Vision (graduate level), University of Salzburg
Summer '15	Seminar Multimedia Technologies (graduate level, with A. Uhl), University of Salzburg
Summer '15	Databases 1 – Proseminar (undergraduate level), University of Salzburg
Summer '15	Machine Learning (graduate level), University of Salzburg
Winter '15	Seminar Multimedia Technologies (graduate level, with A. Uhl), University of Salzburg
Winter '15	Advanced Image Processing & Computer Vision (graduate level), University
	Databases 1 – Proseminar (undergraduate level), University of Salzburg
Summer '14	Imaging Beyond Consumer Cameras (graduate level), University of Salzburg
Winter '13	Advanced Image Processing & Computer Vision(graduate level), University of Salzburg
Winter '11	Introduction to Object Oriented Programming (undergraduate level), University of Applied Sciences
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PROFESSIONAL SERVICE

Winter '05

General Chair of the 39th OAGM/AAPR Workshop 2015, Salzburg, Austria PC Chair of ACM IH & MMSEC 2014, Salzburg, Austria

Network Management (undergraduate level), University of Applied Sciences Salzburg

JOURNAL REVIEWING

Reviewer for IEEE Transactions on Medical Imaging

Reviewer for IEEE Transactions on Image Processing

Reviewer for IEEE Transactions on Signal Processing

Reviewer for IEEE Signal Processing Letters

Reviewer for Elsevier Medical Image Analysis

Reviewer for Foundations of Computational Mathematics

CONFERENCE REVIEWING

Reviewer for Neural Information Processing Systems (NIPS)

Reviewer for IEEE International Conference on Image Processing (ICIP)

Reviewer for Medical Image Computing and Computer Assisted Intervention (MICCAI)

Reviewer for International Conference on Computer Vision (ICCV)

Reviewer for Computer Vision and Pattern Recognition (CVPR)

Reviewer for European Conference on Computer Vision (ECCV)

Reviewer for British Machine Vision Conference (BMVC)

Reviewer for International Conference on Pattern Recognition (ICPR)

REFERENCES

Available upon request.

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