Curriculum Vitae — Roland Kwitt

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Birth Date	March 19, 1982	
Citizenship	Austrian	
Academic Details	*h*-index: 32, Cites: 3758 (Source: Google Scholar, 01/2023)	
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Current Employment

2022 - now **University of Salzburg**
Full Professor (for Machine Learning)
Department of Artificial Intelligence and Human Interfaces (AIHI)
Jakob-Haringer Str. 2, A-5020 Salzburg, Austria
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2020 - 2021 **University of Salzburg**
Full Professor (for Machine Learning)
Department of Computer Science
Jakob-Haringer Str. 2, A-5020 Salzburg, Austria
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2017 - 2020 **University of Salzburg**
Associate Professor
Department of Computer Science
Jakob-Haringer Str. 2, A-5020 Salzburg, Austria

2013 - 2017 **University of Salzburg**
Assistant Professor
Department of Computer Science
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 Uhl, 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)

Awards

2014 CVPR '14 Outstanding Reviewer
2012 Short-listed for the "Heinz-Zemanek" price 2012 (notification e-mail upon request)
2012 **MICCAI '12 Young Investigator Award**, awarded at MICCAI '12 (Nice, France)

2007 **Best Paper Award**, International Conference on Computer Recognition Systems (CORES '07)
2005 **Special Appreciation Award**, Austrian Ministry of Science and Research

Main Research Areas

Machine learning, Computer vision, Medical image analysis

Ranking in selection processes for *Full Professorships*

- Ranked **1st** for § 98 UG professorship *Data Science* at the University of Innsbruck ("Ruf" received 12/2019)
- Ranked **1st** for § 99 UG professorship *Machine Learning / Data Science* at the University of Klagenfurt ("Ruf" received 06/2020)

Third-Party Funding

2020 - now *Intelligent Data Analytics (IDA) Lab* (ongoing)
(together with W. Trutschnig, Department of Mathematics, University of Salzburg and C. Borgelt, Department of Mathematics/Computer Science, University of Salzburg)
Funding source: Land Salzburg (within the WISS 2025 initiative)
Project volume € 2,300.000,00.-

2020 - 2022 *Free-of-Bias, Robust and Intelligent Data Analytics (FRIDA)* (completed)
(together with W. Trutschnig, Department of Mathematics, University of Salzburg)
Funding source: Porsche Holding GmBH
Industrial cooperation partner: Porsche Informatik GmbH
Project volume: € 250.000,00.-

2019 - now *Deep Homological Learning* (ongoing)
Funding source: FWF (Project Nr. `P 31799`)
Project volume: € 238.512,75

2019 - 2022 *Kundenfokussierte Zukunftstrends (KFZ)* (completed)
(together with W. Trutschnig, Department of Mathematics, University of Salzburg)
Funding source: Land Salzburg (within the WISS 2025 initiative)
Industrial cooperation partner: Porsche Informatik GmbH
Project volume: € 478.610,38.-

2018 - 2021 *"Kleinprojekte" Critical data & Feature selection* (completed)
(together with W. Trutschnig, Department of Mathematics, University of Salzburg)
Funding source: Porsche Informatik GmbH
Industrial cooperation partner: Porsche Informatik GmbH
Project volume: € 40,000.-

2018 *Synonym Analysis for Improving Search Queries* (completed)
(together with N. Augsten, Department of Computer Science, University of Salzburg)
Industrial partner: FindoLogic GmbH
Funding source: FFG (Innovationsscheck 5,000)
Project volume: € 5,000.-

2018 *Data Analytics in Industrial Environments* (completed)
(together with W. Trutschnig, Department of Mathematics, University of Salzburg)
Industrial partner: Siemens Austria
Project volume: € 20,000.-

Student Supervision

Primary PhD/PostDoc advisor

- Christoph D. Hofer (PhD & PostDoc in my group; now in industry)
- Günther Eder (PostDoc in my group; now in industry)
- Florian Graf (PhD ongoing)
- Sebastian Zeng (PhD ongoing)

Secondary PhD advisor

- Mann Willi (PhD completed, now at Celonis)
- Wimmer Georg (PhD completed, now PostDoc at University of Salzburg)
- Kauba Christof (PhD completed, now PostDoc at University‘ of Salzburg)
- Ribeiro Eduardo (PhD completed)
- Debiasi Luca (completed)
- González Tejeda Yansel (PhD ongoing)
- Höller Yvonne (PhD ongoing)
- Schraml Rudolf (PhD ongoing)
- Kirchgasser Simon Ignaz (PhD ongoing)

MSc advisor

- Johanna Wald (completed)
- Schmitzberger Nina Marie (completed)
- Michael Kastner (completed)
- Söllinger Dominik (completed)
- Grafendorfer Philipp (completed)
- Tobias Hilgart (completed)
- Philip Brandauer (completed)
- Peer Raphael (completed)
- Marlene Holzleitner (completed)

Publications (in reverse-chronological order)

Journal Articles

[Dyc+21] L.E. van Dyck, R. Kwitt, S.J. Denzler, and W.R. Gruber. “Comparing object recognition in humans and deep convolutional neural networks - An eye tracking study”. In: *Front. Neurosci* 15 (2021). DOI: 10.3389/fnins.2021.750639.

[C H+20] C. Hofer, R. Kwitt, Y. Höller, E. Trinka, and A. Uhl. “An empirical assessment of appearance descriptors applied to MRI for automated diagnosis of TLE and MCI”. In: *Comput. Biol. Med.* 117 (2020). DOI: 10.1016/j.compbiomed.2019.103592.

[CRM19] C. Hofer, R. Kwitt, and M. Niethammer. “Learning Representations of Persistence Barcodes”. In: *J. Mach. Learn. Res.* 20.126 (2019), pp. 1–45.

[D R+19] D. R. Chittajallu, M. McCormick, S. Gerber, T.J. Czernuszewicz, R. Gessner, M.S. Willis, M. Niethammer, R. Kwitt, and S.R. Aylward. "Image-Based Methods for Phase Estimation, Gating, and Temporal Superresolution of Cardiac Ultrasound". In: *IEEE Trans. Biomed. Eng.* 66.1 (2019), pp. 72–79. DOI: 10.1109/TBME.2018.2823279.

[N S+19] N. Stanley, T. Bonacci, R. Kwitt, M. Niethammer, and P.J. Mucha. "Stochastic Block Models with multiple continuous attributes". In: *Appl. Netw. Sci.* 4.54 (2019). DOI: 10.1007/s41109-019-0170-z.

[Z D+19] Z. Ding, G. Fleishman, X. Yang, P. Thomson, R. Kwitt, and M. Niethammer. "Fast predictive simple geodesic regression". In: *Med. Image Anal.* 56 (2019), pp. 193–209. DOI: 10.1016/j.media.2019.06.003.

[N S+18] N. Stanley, R. Kwitt, M. Niethammer, and P.J. Mucha. "Compressing Networks with Super Nodes". In: *Nature Sci. Rep.* 8.10892 (2018). DOI: DOI:10.1038/s41598-018-29174-3.

[X H+18] X. Han, R. Kwitt, S.R. Aylward, S. Bakas, B. Menze, A. Asturias, P. Vespa, J. van Horn, and M. Niethammer. "Brain extraction from normal and pathological images: A joint PCA/Image-Reconstruction approach". In: *NeuroImage* 176.8 (2018), pp. 431–445. DOI: 10.1016/j.neuroimage.2018.04.073.

[Yan+17] X. Yang, R. Kwitt, M. Styner, and M. Niethammer. "Quicksilver: Fast Predictive Image Registration - a Deep Learning Approach". In: *NeuroImage* 158 (2017), pp. 378–396. DOI: 10.1016/j.neuroimage.2017.07.008.

[Hon+16a] Y. Hong, R. Kwitt, N. Singh, N. Vasconcelos, and M. Niethammer. "Parametric Regression on the Grassmannian". In: *IEEE Trans. Pattern Anal. Mach. Intell.* 38.11 (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 Trans. Med. Imaging* 34.12 (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: *Med. Image Anal.* 18.4 (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: *Med. Image Anal.* 17.7 (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: *Med. Image Anal.* 16.7 (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 Trans. Image Process.* 20.7 (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 Trans. Image Process.* 20.2 (2011), pp. 474–484. DOI: 10.1109/TIP.2010.2064327.

[KU10a] R. Kwitt and A. Uhl. "Lightweight Probabilistic Texture Retrieval". In: *IEEE Trans. Image Process.* 19.1 (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 Anal. Appl.* 12.4 (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 Recognit.* 42.6 (2008), pp. 1180–1191. DOI: doi:10.1016/j.patcog.2008.07.012.

Conference Articles / Preprints

[Gra+22] F. Graf, S. Zeng, B. Rieck, M. Niethammer, and R. Kwitt. "On Measuring Excess Capacity in Neural Networks". In: *NeurIPS*. 2022.

[F G+21] F. Graf, C. Hofer, M. Niethammer, and R. Kwitt. "Dissecting Supervised Constrastive Learning". In: *ICML*. 2021.

[H G+21] H. Greer, R. Kwitt, F.-X. Vialard, and M. Niethammer. "ICON: Learning Regular Maps Through Inverse Consistency". In: *ICCV*. 2021.

[ZGK21] S. Zeng, F. Graf, and C. Hofer R. Kwitt. "Topological Attention for Time Series Forecasting". In: *NeurIPS*. 2021.

[C H+20a] C. Hofer, F. Graf, B. Rieck, M. Niethammer, and R. Kwitt. "Graph Filtration Learning". In: *ICML*. 2020.

[C H+20b] C. Hofer, F. Graf, M. Niethammer, and R. Kwitt. "Topologically Densified Distributions". In: *ICML*. 2020.

[F-X+20] F.-X. Vialard, R. Kwitt, S. Wei, and M. Niethammer. "A Shooting Formulation of Deep Learning". In: *NeurIPS*. 2020.

[C H+19] C. Hofer, R. Kwitt, M. Dixit, and M. Niethammer. "Connectivity-Optimized Representation Learning via Persistent Homology". In: *ICML*. 2019.

[MF19] M. Niethammer and R. Kwitt F.-X. Vialard. "Metric Learning for Image Registration". In: *CVPR*. 2019. DOI: 10.1109/CVPR.2019.00866.

[Liu+18a] B. Liu, M. Dixit, R. Kwitt, and N. Vasconcelos. "Feature Space Transfer for Data Augmentation". In: *CVPR*. 2018. DOI: 10.1109/CVPR.2018.00947.

[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. DOI: 10.1109/ISBI.2018.8363857.

[Dix+17] M. Dixit, R. Kwitt, M. Niethammer, and N. Vasconcelos. "AGA: Attribute-Guided Augmentation". In: *CVPR*. 2017. DOI: 10.1109/CVPR.2017.355.

[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. DOI: 10.1109/ISBI.2017.7950456.

[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. DOI: 10.1007/978-3-319-59050-9_9.

[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. DOI: 10.1109/ISBI.2017.7950556.

[Hof+17c] C. Hofer, R. Kwitt, M. Niethammer, and A. Uhl. "Deep Learning with Topological Signatures". In: *NIPS*. 2017. URL: https://bit.ly/2UHfsCf.

[Hon+17] Y. Hong, X. Yang, R. Kwitt, M. Styner, and M. Niethammer. "Regression Uncertainty on the Grassmannian". In: *AISTATS*. 2017. URL: https://bit.ly/2HL9nB0.

[Yan+17] X. Yang, R. Kwitt, M. Styner, and M. Niethammer. "Fast Predictive Multimodal Image Registration". In: *ISBI*. 2017. DOI: 10.1109/ISBI.2017.7950652.

[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. DOI: 10.1109/ISBI.2016.7493282.

[KHN16a] R. Kwitt, S. Hegenbart, and M. Niethammer. "One-Shot Learning of Scene Locations via Feature Trajectory Transfer". In: *CVPR*. 2016. DOI: 10.1109/CVPR.2016.16.

[Ayl+16a] S. Alyward, M. McCormick, H.J. Kang, S. Razzaque, R. Kwitt, and M. Niethammer. "Ultrasound Spectroscopy". In: *ISBI*. 2016. DOI: 10.1109/ISBI.2016.7493437.

[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. DOI: 10.1007/978-3-319-46630-9_10.

[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. DOI: 10.1007/978-3-319-46976-8_6.

[Kwi+15a] R. Kwitt, S. Huber, M. Niethammer, W. Lin, and U. Bauer. "Statistical Topological Data Analysis – A Kernel Perspective". In: *NIPS*. 2015. URL: https://bit.ly/2ucS0B9.

[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

11/2022 *On Measuring Excess Capacity in Neural Networks*, NeurIPS '22, New Orleans, USA
11/2021 *Topological Attention for Time Series Forecasting*, NeurIPS '21 (Virtual conference)
06/2021 *Dissecting Supervised Contrastive Learning*, ICML '21 (Virtual conference)
12/2020 *A Shooting Formulation of Deep Learning*, NeurIPS '20 (Virtual conference)
07/2020 *Topologically Densified Distributions*, ICML '20, Vienna, Austria (Virtual conference)
07/2020 *Graph Filtration Learning*, ICML '20, Vienna, Austria (Virtual conference)
09/2019 *Deep Homological Learning*, ÖMG Tagung, Dornbirn, Austria
06/2019 *Metric Learning for Image Registration*, CVPR '19, Long Beach, CA, USA
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
10/2012 *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
10/2007 *Modeling the Marginal Distributions of Complex Wavelet Coefficient Magnitudes for the Classification of Zoom-Endoscopy Images*, MMBIA '07, Rio de Janeiro, Brazil

Invited Talks

04/2022 *Topologically Densified Distributions*
ICLR Workshop on Geometrical and Topological Representation Learning 2022 (Virtual)
09/2021 *Topological Machine Learning*
Thematic Mini-Conference on Computational Topology and Machine Learning (Virtual)
Berlin Mathematics Research Center
09/2019 *Deep Homological Learning*
ÖMG Conferene 2019, Dornbirn (in the *Computational Geometry and Topology* session)
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
07/2015 *Topological Machine Learning*
ISNPS '15, Graz Austria
04/2014 *Grassmannian Geodesic Regression*
IST Austria, Austria
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
10/2012 *Recognition in US Video: Where Am I?*
University of North Carolina, Chapel Hill (Computer Science), NC, USA

Teaching

Except for a small selection of undergraduate courses, all lectures/labs are taught in English.

WS 22/23 Introduction to AI / AI Eingangswerkstatt (VO, undergraduate level), University of Salzburg
WS 22/23 Interpreting and Presenting Statistical Analyses (SE, graduate level), University of Salzburg
WS 22/23 Case Studies (SE, graduate level), University of Salzburg
WS 22/23 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
WS 22/23 Computer Vision (VO+PS, graduate level), University of Salzburg
SS 22 Machine Learning (VO+PS, graduate level), University of Salzburg
SS 22 Databases 1 (VO+PS, undergraduate level), University of Salzburg
SS 22 Medical Imaging (VO+PS, graduate level), University of Salzburg
SS 22 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
WS 21/22 Interpreting and Presenting Statistical Analyses (SE, graduate level), University of Salzburg
WS 21/22 Case Studies (SE, graduate level), University of Salzburg
WS 21/22 Introduction to Data Science (SE, graduate level), University of Salzburg
WS 21/22 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
WS 20/21 Computer Vision (VO+PS, graduate level), University of Salzburg
SS 21 Machine Learning (VO+PS, graduate level), University of Salzburg
SS 21 Databases 1 (VO+PS, undergraduate level), University of Salzburg
SS 21 Imaging Beyond Consumer Cameras (VO+PS, graduate level), University of Salzburg
SS 21 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
WS 20/21 Interpreting and Presenting Statistical Analyses (SE, graduate level), University of Salzburg
WS 20/21 Case Studies (SE, graduate level), University of Salzburg
WS 20/21 Introduction to Data Science (SE, graduate level), University of Salzburg
WS 20/21 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
WS 20/21 Computer Vision (VO+PS, graduate level), University of Salzburg
SS 20 Machine Learning (VO+PS, graduate level), University of Salzburg
SS 20 Databases 1 (VO+PS, undergraduate level), University of Salzburg

SS 20 Imaging Beyond Consumer Cameras (VO+PS, graduate level), University of Salzburg
SS 20 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
WS 19/20 Interpreting and Presenting Statistical Analyses (SE, graduate level), University of Salzburg
WS 19/20 Case Studies (SE, graduate level), University of Salzburg
WS 19/20 Introduction to Data Science (SE, graduate level), University of Salzburg
WS 19/20 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
WS 19/20 Computer Vision (VO+PS, graduate level), University of Salzburg
SS 19 Imaging Beyond Consumer Cameras (VO+PS, graduate level), University of Salzburg
SS 19 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
SS 19 Machine Learning (VO+PS, graduate level), University of Salzburg
SS 19 Databases 1 (PS, undergraduate level), University of Salzburg
WS 18/19 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
WS 18/19 Computer Vision (VO+PS, graduate level), University of Salzburg
WS 18/19 Introduction to Data Science (SE, graduate level), University of Salzburg
WS 18/19 Case Studies (SE, graduate level), University of Salzburg
WS 18/19 BSc Seminar (SE, undergraduate level), University of Salzburg
SS 18 Imaging Beyond Consumer Cameras (VO+PS, graduate level), University of Salzburg
SS 18 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
SS 18 Machine Learning (VO+PS, graduate level), University of Salzburg
SS 18 Databases 1 (PS, undergraduate level), University of Salzburg
SS 18 BSc Seminar (SE, undergraduate level), University of Salzburg
WS 17/18 Wissenschaftliche Arbeitstechniken (VP, undergraduate level)
WS 17/18 Image Processing and Computer Vision (VO+PS, undergraduate level), University of Salzburg
WS 17/18 Case Studies (SE, graduate level), University of Salzburg
WS 17/18 Computer Vision (VO+PS, graduate level), University of Salzburg
WS 17/18 Introduction to Data Science (SE, graduate level), University of Salzburg
SS 17 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
SS 17 Machine Learning (VO+PS, graduate level), University of Salzburg
SS 17 Computer Science for Everyone (VO, undergraduate level), University of Salzburg
SS 17 Databases 1 (VO+PS, undergraduate level), University of Salzburg
SS 17 BSc Seminar (SE, undergraduate level), University of Salzburg
WS 16/17 Introduction to Operating Systems (VO, undergraduate level), University of Salzburg
WS 16/17 Computer Vision (VO+PS, graduate level), University of Salzburg
WS 16/17 Introduction to Data Science (SE, graduate level), University of Salzburg
WS 16/17 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
SS 16 Imaging Beyond Consumer Cameras (VO+PS, graduate level), University of Salzburg
SS 16 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
SS 16 Databases 1 (PS, undergraduate level), University of Salzburg
WS 15/16 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
WS 15/16 Advanced Image Processing & Computer Vision (VO+PS, graduate level), University of Salzburg
SS 15 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
SS 15 Databases 1 (PS, undergraduate level), University of Salzburg
SS 15 Machine Learning (VO+PS, graduate level), University of Salzburg
WS 14/15 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
WS 14/15 Advanced Image Processing & Computer Vision (VO+PS, graduate level), University
SS 14 Databases 1 (PS, undergraduate level), University of Salzburg
SS 14 Imaging Beyond Consumer Cameras (VO+PS, graduate level), University of Salzburg
SS 14 Seminar Multimedia Technologies (SE, graduate level), University of Salzburg
WS 13/14 Advanced Image Processing & Computer Vision(VO+PS, graduate level), University of Salzburg
WS 10/11 Introduction to Object Oriented Programming (VO, undergraduate level), FH Salzburg
WS 05/06 Network Management (UE, undergraduate level), FH Salzburg

Service to the University of Salzburg

2022 - now Head of the *Curricularkommission BA Artificial Intelligence*
2022 - now Head of the workgroup *Visual Computing and Machine Learning (VCM)*

2022 - now Deputy head of the department of *Artificial Intelligence and Human Interfaces (AIHI)*
2016 - now Member of the *Curricularkommission MA Data Science*
2019 - 2021 Member of the *Curricularkommission BA/MA Computer Science*
2019 Appointment committee member for the *Assistant Professor position in Database Systems*
2017 - 2018 Appointment committee member for the *§ 99 UG professorship for Data Science* ("Stiftungsprofessur")

Professional Service

Area Chair for ICML '22, ICML '23, NeurIPS '21, NeurIPS '22
General Chair of the 39th OAGM/AAPR Workshop 2015, Salzburg, Austria
Organizer of the 3rd Biannual Austrian TDA Meeting 2022, Salzburg, Austria
PC Chair of ACM IH & MMSEC 2014, Salzburg, Austria

Journal reviewing

Reviewer for *Journal of Machine Learning Research (JMLR)*
Reviewer for *IEEE Transactions on Medical Imaging (TMI)*
Reviewer for *IEEE Transactions on Image Processing (TIP)*
Reviewer for *IEEE Transactions on Signal Processing*
Reviewer for *IEEE Signal Processing Letters*
Reviewer for *Elsevier Medical Image Analysis (MedIA)*
Reviewer for *Foundations of Computational Mathematics (FOCM)*
Reviewer for *Journal of Applied and Computational Topology (APCT)*

Conference reviewing

Reviewer for *International Conference on Learning Representations (ICLR)*
Reviewer for *International Conference on Machine Learning (ICML)*
Reviewer for *Artificial Intelligence and Statistics (AISTATS)*
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)*

Funding agencies

Reviewer for the *European Research Council (ERC)*

References

Available upon request.

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