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Birth Date March 19, 1982
Birth Place Austria
Citizenship Austrian
Marital Status married (to Daniela Kwitt)
Academic Details *h*-index: 17, Cites: 934 (Source: Google Scholar, August 2017)

CURRENT EMPLOYMENT

2017–now **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
Jakob-Haringer Str. 2, A-5020 Salzburg, Austria

PREVIOUS EMPLOYER(S)

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

SKILLS

Languages: German (native), English (fluent)
Programming: C/C++, JAVA, MATLAB, Python, Perl, Bash
Operating Systems: Linux, MacOS X, Windows

PUBLICATIONS (IN REVERSE-CHRONOLOGICAL ORDER)

JOURNAL ARTICLES

- [X Y+17] X. Yang, R. Kwitt, M. Styner, and M. Niethammer. “Quicksilver: Fast predictive image registration - A deep learning approach”. In: *Neuroimage* (July 2017), pp. 378–396. doi: [10.1016/j.neuroimage.2017.07.008](https://doi.org/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 Transactions on Pattern Analysis and Machine Intelligence* 38.11 (Nov. 2016). doi: [10.1109/TPAMI.2016.2516533](https://doi.org/10.1109/TPAMI.2016.2516533).
- [Liu+15a] X. Liu, M. Niehammer, 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1016/j.patcog.2008.07.012).

CONFERENCE ARTICLES

- [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.
- [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. Alyward, 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1007/978-3-319-10470-6_14).
- [Kwi+14a] R. Kwitt, S. Razzaque, J. Lowell, and S. Alyward. “Variability sensitivity of dynamic texture based recognition in clinical CT data”. In: *SPIE Medical Imaging*. 2014. DOI: [10.1117/12.2043271](https://doi.org/10.1117/12.2043271).
- [Liu+14a] X. Liu, M. Niethammer, R. Kwitt, M. McCormick, and S. Alyward. “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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1007/978-3-642-40760-4_73).
- [Kwi+13a] R. Kwitt, D. Pace, M. Niethammer, and S. Alyward. “Studying Cerebral Vasculature Using Structure Proximity and Graph Kernels”. In: *MICCAI*. 2013. DOI: [10.1007/978-3-642-40763-5_66](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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/1S4c1A>.
- [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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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

- 07/2017 *AGA: Attribute-Guided Augmentation*, CVPR '17, Honolulu, HI, 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

- 04/2016 *Low rank to the Rescue: Atlas-based Analyses in the Presence of Pathologies* (invited by R. Werner) at "Images and Networks of the Brain", Hamburg, Germany
- 07/2015 *Topological Machine Learning*, (invited by J.S. Marron) at ISNPS '15, Graz Austria
- 04/2014 *Grassmannian Geodesic Regression* (invited by Edelsbrunner group) at 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* (invited by N. Vasconcelos) at SVCL, UC San Diego, USA
- 10/2012 *Recognition in US Video: Where Am I?* at UNC, Chapel Hill (Computer Science), NC, USA

TEACHING

- 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
- Winter '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
- Summer '14 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 Salzburg
- Winter '05 Network Management (undergraduate level), University of Applied Sciences Salzburg

PROFESSIONAL SERVICE

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

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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