

Publications

Prof. Dr. Brigitte Forster-Heinlein

Professor for Applied Mathematics, University of Passau

Articles

1. Florian Heinrich and Brigitte Forster: *Lifting of quaternionic frames to higher dimensions with partial ridges*. Accepted in *Advances in Applied Clifford Analysis*. 2020. In Press.
2. Peter Massopust, Brigitte Forster and Ole Christensen: *Fractional and Complex Pseudo-Splines and the Construction of Parseval Frames*. *Applied Mathematics and Computation*, Vol. 314, 2017, pp. 12–24
3. Andreas Schindele, Peter Massopust, and Brigitte Forster: *Multigrid Convergence for the MDCA-Curvature Estimator*. *Journal of Mathematical Imaging and Vision*, Vol. 57, 2017, pp. 423–438
4. Johannes Nagler, Paula Cerejeiras, and Brigitte Forster: *A lower bound for the Schoenberg operator*. *Journal of Complexity*, Vol. 32 (1), February 2016, pp. 81–91
5. Ole Christensen, Brigitte Forster and Peter Massopust: *Directional time-frequency analysis via continuous frames*. *Bull. Aust. Math. Soc.*, Vol. 92, 2015, pp. 268–281.
6. Brigitte Forster, Ramūnas Garunkštis, Peter Massopust and Jörn Steuding: *Complex B-splines and Hurwitz zeta functions*, *LMS J. Comput. Math.* 16, 2013, pp. 61–77.
7. Brigitte Forster, Peter Massopust, and Thomas Übelacker: *Periodic Splines of Complex Order*. *Numerical Functional Analysis and Optimization, Special issue on Operator Algebra and Representation Theory: Frames, Wavelets and Fractals*, Vol. 33 (7-9), 2012, pp. 989–1004.
8. Brigitte Forster and Peter Massopust: *Splines of Complex Order: Fourier, Filters and Fractional Derivatives*. *Sampling Theory in Signal and Image Processing*, Vol. 10, No. 1-2, 2011, pp. 89–110.
9. Dimitri Van De Ville, Brigitte Forster, Michael Unser and Thierry Blu: *Analytical Footprints: Compact Representation of Elementary Singularities in Wavelet Bases*. *IEEE Trans. Signal Proc.*, Vol. 58, Issue 12, Dec. 2010, pp. 6105–6118.
10. Stefan Held, Martin Storath, Peter Massopust, Brigitte Forster: *Steerable wavelet frames based on the Riesz transform*. *IEEE Transactions on Image Processing*, Vol. 19, No. 3, 2010, pp. 653–667.
11. Peter Massopust, Brigitte Forster: *Multivariate Complex B-Splines and Dirichlet Averages*. *Journal of Approximation Theory*, Vol. 162, 2010, pp. 252–269.
12. Brigitte Forster, Peter Massopust: *Statistical Encounters with Complex B-Splines*. *Constructive Approximation*, Vol. 29, No. 3, 2009, pp. 325–344.

13. Brigitte Forster, Thierry Blu, Dimitri Van De Ville, Michael Unser: *Shift-invariant spaces from rotation-covariant functions*. Applied and Computational Harmonic Analysis, Vol. 25, No. 2, September 2008, pp. 240–265.
14. Brigitte Forster, Peter Massopust: *Some Remarks about the Connection between Fractional Divided Differences, Fractional B-Splines, and the Hermite-Genocchi Formula*. International Journal of Wavelets, Multiresolution and Information Processing, Vol. 6, No. 2, 2008, pp. 279–290.
15. Laurent Condat, Dimitri Van De Ville, Brigitte Forster-Heinlein: *Reversible, Fast, and High-Quality Grid Conversions*. IEEE Transactions on Image Processing, Vol. 17, No. 5, pp. 679–693, May 2008.
16. Brigitte Forster: *Approximation in Smirnov spaces: Direct and Inverse Theorems*. Constructive Approximation, Volume 26, Number 1, June 2007, pp. 49–64.
17. Brigitte Forster, Thierry Blu and Michael Unser: *Complex B-Splines*. Applied and Computational Harmonic Analysis, Volume 20, Issue 2, pp. 261–282, March 2006. Special Issue: Computational Harmonic Analysis - Part 3, Edited by Akram Aldroubi and Charles Chui.
18. Brigitte Forster: *Approximated Leont'ev coefficients*. Journal of Computational Analysis and Applications, Vol. 7, No. 2, pp. 123–134, 2005.
19. Brigitte Forster: *Direct Approximation Theorems for Dirichlet Series in the Norm of Uniform Convergence*. Journal of Approximation Theory 132, pp. 1–14, 2005
20. Brigitte Forster: *On the relation between Fourier and Leont'ev coefficients with respect to Smirnov spaces*. Ukrainian Mathematical Journal, No. 4, pp. 628–640, 2004.
21. Brigitte Forster, Dimitri Van De Ville, Jesse Berent, Daniel Sage, Michael Unser: *Complex Wavelets for Extended Depth-of-Field: A New Method for the Fusion of Multi-Channel Microscopy Images*. Microscopy Research and Technique 65, pp. 33–42, 2004.
22. Brigitte Forster: *Inverse approximation theorems for Dirichlet series on convex polygons in $AC(D)$* . East Journal on Approximations, Vol. 9, No. 3, pp. 305–322, 2003.
23. Brigitte Forster: *An algorithm for nonharmonic signal analysis using Dirichlet series on convex polygons*. Electron. Trans. Numer. Anal., Volume 14, pp. 45–55, 2002.
24. Brigitte Forster: *On the relation between Fourier and Leont'ev coefficients with respect to the space $AC(D)$* . Comput. Methods Funct. Theory, Vol. 1, No. 1, pp. 193–204, 2001.

Books

1. Brigitte Forster and Peter Massopust (Eds.): *Four Short Courses in Harmonic Analysis. Wavelets, Frames, Time Frequency Methods, and Applications to Signal and Image Analysis*. With contributions by Ole Christensen, Brigitte Forster, Karlheinz Gröchenig, Demetrio Labate, Peter Massopust, Pierre Vandergheynst, Guido Weiss, Yves Wiaux. Series Applied and Numerical Harmonic Analysis. Birkhäuser, 2009.
2. Wolfgang zu Castell, Frank Filbir and Brigitte Forster (Eds.): *Inzell Lectures on Orthogonal Polynomials*. Advances in the Theory of Special Functions and Orthogonal Polynomials, Volume 2. Nova Science Publishers, 2004.

Book chapters

1. Brigitte Forster and Gunter Semmler: *Entire functions in generalized Bernstein spaces and their growth behavior*. (Invited contribution.) In: G.E. Pfander (ed.): “Sampling Theory, a Renaissance”, Birkhäuser, 2015, pp. 307–329.
2. Brigitte Forster: *Five good reasons for complex-valued transforms in image processing*. (Invited contribution.) In: G. Schmeißer and A. Zayed (Eds.): *New Perspectives on Approximation and Sampling Theory – Festschrift in honor of Paul Butzer’s 85th birthday*. Birkhäuser. 2014.
3. Brigitte Forster: *Splines and Multiresolution Analysis*. (Invited contribution.) In: Otmar Scherzer (Ed.): *Handbook of Mathematical Methods in Imaging*. Springer, First Edition 2010, pp. 1231–1270. Second edition 2015, pp. 1675–1716.
4. Peter Massopust and Brigitte Forster: *Mathematical Aspects of Time Frequency Analysis*. In: *Four Short Courses in Harmonic Analysis. Wavelets, Frames, Time Frequency Methods, and Applications to Signal and Image Analysis*. Birkhäuser, 2009. pp. 1–49.

Proceedings

1. Alea Strobel, Brigitte Forster and Virginie Uhlmann: A Comparison of curvature estimation methods for bioimaging. (Extended Abstract) IEEE International Symposium on Biomedical Imaging ISBI, Nice, 2021. In press.
2. Robert Aufschläger and Brigitte Forster: Curvature – A Comparison of the MDCA and the λ -MDCA estimator. (Extended Abstract). IEEE International Symposium on Biomedical Imaging ISBI, Venice, Italy, April 2019.
3. Brigitte Forster and Peter Massopust: Short Communication: Multivariate interpolation with fundamental splines of fractional order. Proc. Appl. Math. Mech. (PAMM) , Vol. 11, pp. 857–858, 2011.
4. Brigitte Forster, Peter Massopust: Interpolation with fundamental splines of fractional order. SampTA 2011. Singapore.
5. Brigitte Forster, Gunter Semmler: Growth estimates of Korevaar type for entire functions in generalized Bernstein spaces. SampTA 2011. Singapore.
6. Brigitte Forster, Peter Massopust: *Multivariate Complex B-Splines, Dirichlet Averages and Difference Operators*. SAMPTA’09, May 2009, Marseille, France.
7. Brigitte Forster, Peter Massopust: *Multivariate Complex B-Splines*. SPIE Wavelets XII, August 2007, San Diego, USA.
8. Laurent Condat, Brigitte Forster-Heinlein, Dimitri Van De Ville: *Rotation-covariant polyharmonic spline wavelets on the hexagonal lattice*. SPIE Wavelets XII, August 2007, San Diego, USA.
9. Laurent Condat, Brigitte Forster-Heinlein, Dimitri Van De Ville: *H2O: reversible hexagonal-orthogonal grid conversion by 1-D filtering*. Proceedings of the International Conference on Image Processing (ICIP’07), San Antonio, USA, September 2007.

10. Stefan Pfeifer, Thomas Schratzenstaller, Brigitte Forster-Heinlein, Karin Knör, Iris Grabmair, Erich Wintermantel: *Stent-induced arterial deformation*. Proceedings of “Gemeinsame Jahrestagung der Schweizerischen, Deutschen und Österreichischen Gesellschaft für Biomedizinische Technik BMT 2006”, Zurich, Switzerland, 6.–9. September 2006. Best Student Poster Award for Stefan Pfeifer.
11. Dimitri Van De Ville, Thierry Blu, Brigitte Forster, Michael Unser: *Semi-Orthogonal Wavelets That Behave like Fractional Differentiators*. Proceedings of the SPIE Optics and Photonics 2005 Conference on Mathematical Methods: Optical Engineering and Instrumentation (Wavelet XI), San Diego CA, USA, July 31–August 3, 2005, vol. 5914.
12. Florian Luisier, Thierry Blu, Brigitte Forster, Michael Unser: *Which Wavelet Bases Are the Best for Image Denoising?* Proceedings of the SPIE Optics and Photonics 2005 Conference on Mathematical Methods: Optical Engineering and Instrumentation (Wavelet XI), San Diego CA, USA, July 31–August 3, 2005, vol. 5914.
13. Dimitri Van De Ville, Thierry Blu, Brigitte Forster, Michael Unser: *Isotropic-Polyharmonic B-Splines and Wavelets*. Proceedings of the 2004 IEEE International Conference on Image Processing (ICIP’04), Singapore, Singapore, October 24–27, 2004.
14. Brigitte Forster, Dimitri Van De Ville, Jesse Berent, Niels Quack, Daniel Sage, Michael Unser: *Extended Depth-of-Field for Color Images in Light Microscopy: Image Fusion and 3D Visualization*. Proceedings of the 2004 Annual Meeting of the Swiss Society of Biomedical Engineering (SSBE’04), Zurich ZH, Switzerland, September 2–3, 2004. Max Anliker Memorial Poster Award.
15. Brigitte Forster, Dimitri Van De Ville, Jesse Berent, Daniel Sage, Michael Unser: *Extended depth-of-focus for multi-channel microscopy images: a complex wavelet approach*. Proceedings of the Second IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI’04), Arlington VA, USA, April 15–18, 2004.
16. Brigitte Forster, Thierry Blu, Michael Unser: *A new family of complex rotation-covariant multiresolution bases in 2D*. Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing X, San Diego CA, USA, August 3–8, 2003, pp. 475–479, Nov. 2003.

Technical Reports

1. Brigitte Forster, Fritz Haselbeck and Martin Kreuzer: Understanding mathematics with both hands – The Passau Math Museum. MATRIX conference, Sept. 2014, Dresden, Germany.
2. Ulrich Rührmair, Christian Hilgers, Sebastian Urban, Agnes Weierhäuser, Elias Dinter, Brigitte Forster and Christian Jirauschek: *Revisiting Optical Physical Unclonable Functions*. IACR Cryptology ePrint Archive: Report 2013/215.

Preprints

1. Florian Schwarz, Shabhrish Reddy Uddehal, Alexander Lodermeier, Brigitte Forster-Heinlein, Stefan Becker: Interaction of flow pattern and heat transfer in oscillating heat pipes for hot spot applications. Submitted to Applied Thermal Engineering. 2021.

2. Sima Caspari, Brigitte Forster-Heinlein, Jutta Mägdefrau, Lena Bachl: Student-generated Questions: Developing Mathematical Competence through Online-Assessment. Submitted to the International Journal for the Scholarship of Teaching and Learning. 2021.
3. Sima Caspari, Brigitte Forster-Heinlein, Jutta Mägdefrau, Lena Bachl: Sustainable E-Assessment in Mathematics Instruction. Submitted to 11th International Conference on Mathematics Education & Society, Klagenfurt, Austria. 2021.

Theses

1. Dissertation: *Anharmonische Fourier-Reihen zur Signal-Analyse*. Technische Universität München, 2001 (German). Awarded by the Hurwitzgesellschaft zur Förderung der Mathematik an der TU München, November 2001.
2. Diploma Thesis: *Wavelets zur Behandlung von Differentialoperatoren*. Technische Universität München, 1998 (German). Awarded by the Hurwitzgesellschaft zur Förderung der Mathematik an der TU München, June 1999.

Patent

1. Patent Pending: *Method and apparatus for displaying mammographic images*. Inventors: Dr. Peter Heinlein, Dr. Brigitte Forster, Dr.-Ing. habil. Wilfried Schneider, Dipl.-Phys. Siegfried Janssen. Applicant: Image Diagnost International GmbH. Patent Number EP 1584049, 2005.