



THIERRY BLU

IEEE Fellow

*Department of Electronic Engineering
The Chinese University of Hong Kong
Shatin N.T., HONG KONG*

Tel: (852) 3943 8288 Fax: (852) 2603 5558

email: thierry.blu@m4x.org

Web: www.ee.cuhk.edu.hk/~tblu/

RESEARCH INTERESTS

Signal processing	Real, complex wavelets and multiresolution analysis; Filter banks; Nonseparable multidimensional cases
Approximation theory	Uniform, nonuniform splines; Interpolation, approximation error; Variational approximation problems; Sparse approximation, Finite Rate of Innovation
Statistics	Detection and estimation; Signal/Image denoising, Stein's Unbiased Risk Estimate; Generalized stochastic processes, fractional Brownian motions (fBm)
Modelling	Auditory system, psychoacoustics
Physics	Wave propagation, optics, holography
Applications	Biomedical imaging (microscopy, cryo-EM, MRI, fMRI, PET, OCT, Terahertz, etc.); Electroencephalography (EEG)

EDUCATION

1986	“Diplôme d'ingénieur ¹ ” from <i>École Polytechnique</i> ² –Palaiseau, France: strong emphasis on mathematical analysis (integration, distribution theory and statistics) and theoretical physics (quantum mechanics, wave propagation, statistical physics)
1988	“Diplôme d'ingénieur” from <i>École Nationale Supérieure des Télécommunications (ENST)</i> –Paris, France: emphasis on electrical engineering and communications
1996	PhD in electrical engineering from ENST (with highest honours): <i>Fractional Octave Band Iterated Filter Banks—Application to Audio Sound Processing</i> advised by Prof. Pierre DUHAMEL

POSITIONS

2008–present	<i>The Chinese University of Hong Kong</i> : Professor (tenured 2011) in the department of <i>Electronic Engineering</i> , head of the Image and Video Processing Lab
1998–2007	<i>Swiss Federal Institute of Technology in Lausanne (EPFL)</i> : Project leader, then “Scientific Adjunct” in the <i>Biomedical imaging Laboratory</i> headed by Prof. Michael UNSER; responsible for the mathematical aspects of Image Processing
1988–2014	“Ingénieur des Télécoms/Mines” then “Ingénieur en Chef des Télécoms/Mines ³ ” (since 1997) in the French Telecommunication administration, on sabbatical leave from 1998
1994–1998	<i>France Telecom Research & Development</i> –Paris: researcher in audio and image processing within the <i>Groupware and Videotelephony</i> department
1988–1993	<i>France Telecom Research & Development</i> –Paris: researcher in wave propagation (1988–1990) then in signal processing (wavelets, filterbanks) within the <i>Centre de Recherche en Physique de l'Environnement Terrestre et Planétaire</i> ⁴

¹Equivalent to a Master of Science Degree

²The most prestigious higher education institution in France (see <http://en.wikipedia.org/wiki/Polytechnique>)

³Chief Telecommunication/Mining Engineer

⁴Research Center in Physics of the Environment of the Earth and the Planets

PROFESSIONAL ACTIVITIES

Editor in Chief	<i>Sampling Theory in Signal and Image Processing</i> (2009–2018)
Associate Editor	<i>IEEE Transactions on Image Processing</i> (2002–2006) <i>IEEE Transactions on Signal Processing</i> (2006–2010) <i>Elsevier Signal Processing</i> (2008–2011) <i>EURASIP Journal on Image and Video Processing</i> (2009–) <i>SIAM Journal on Imaging Sciences</i> (2019–)
Guest Editor	<i>Elsevier Signal Processing</i> Special Issue on Advances in Multirate Filter Bank Structures and Multiscale Representations (2011)
Chair	Program Committee for <i>WavE 2006</i> (Lausanne) General Co-Chair of <i>SAMPTA 2011</i> (Singapore) Asia liaison for <i>ISBI 2012</i> (Barcelona), <i>SSP 2012</i> (Ann Arbor, MI) International liaison <i>EUSIPCO 2015</i> (Nice, France)
Member	IEEE Signal Processing Society <i>Signal Processing Theory and Methods</i> Technical Committee (2008–2013), <i>Biomedical Imaging and Signal Processing</i> Technical Committee (2017–2022) Program Committee for various conferences (e.g., <i>EUSIPCO</i> , <i>SPIE Wavelet</i> , <i>BioMed</i> , <i>APSIPA</i> , <i>SSP</i> , etc. <i>ICIP 2006</i> special session organizer.
Session Chair	<i>SPIE Wavelet VII and X</i> , <i>Pacific Rim Conference on Mathematics</i> 2001 (Taipeh), <i>International Conference on Superresolution Imaging</i> 2005 (Hong Kong), <i>ICIP</i> 2010, 2017, 2019 <i>ICASSP</i> 2019
Reviewer	Various <i>IEEE Transactions</i> , <i>IEEE conferences</i> , <i>SIAM</i> publications, <i>Nature Methods</i> , <i>JOSA</i> , books, conferences and research grant proposals
Jury	Chairman/Member of PhD and award committees

INVITATIONS (since 2008)

4–18/07/2008	<i>École Polytechnique Fédérale de Lausanne</i> (Prof. Martin Vetterli)
19–26/07/2008	<i>Technical University Munich</i> (Prof. Brigitte Forster)
24–25/10/2008	<i>National Taiwan University</i> (Prof. I-Liang Chern)
18–21/06/2009	<i>Nanyang Technological University</i> (Prof. Pina Marziliano)
29/06/2009	<i>INRIA Sophia Antipolis</i> (Prof. Josiane Zerubia)
10–14/08/2010	<i>NICTA Canberra</i> (Dr. Karim Seghouane)
9–11/05/2011	<i>Temasek Laboratories, Singapore</i> (Dr. Chong Meng See)
23/06–8/07/2011	<i>École Polytechnique Fédérale de Lausanne</i> (Prof. Martin Vetterli)
2–5/06/2012	<i>Nanyang Technological University</i> (Prof. Tee Hiang Cheng)
18–22/07/2012	<i>Imperial College, London</i> (Prof. Pier-Luigi Dragotti)
5–19/07/2013	<i>École Polytechnique Fédérale de Lausanne</i> (Prof. Martin Vetterli)
7–11/07/2014	<i>University of Bristol</i> (Prof. Alin Achim)
1/02–30/06/2015	<i>University of Vienna</i> (Prof. Torsten Möller)
29/03–2/04/2015	<i>École Polytechnique Fédérale de Lausanne</i> (Prof. Dimitri Van De Ville)
21–22/05/2015	<i>Imperial College, London</i> (Prof. Pier-Luigi Dragotti)
1/07–31/12/2015	<i>Harvard University</i> (Prof. Yue Lu)
17/09/2015	<i>New York University</i> (Prof. Ivan Selesnick)
14–17/10/2015	<i>University of Illinois at Urbana-Champaign</i> (Prof. Pierre Moulin)
18–21/10/2015	<i>University of Iowa</i> (Prof. Mathews Jacob)
26/06–10/07/2016	<i>École Polytechnique Fédérale de Lausanne</i> (Prof. Martin Vetterli)
27–28/04/2017	<i>Melbourne University</i> (Prof. Karim Seghouane)
22–24/04/2018	<i>École Polytechnique Fédérale de Lausanne</i> (Prof. Michael Unser)
9–11/07/2018	<i>Yokohama University</i> (Prof. Koichi Ichige)
27/06–16/07/2019	<i>Imperial College, London</i> (Prof. Kin Leung)

AWARDS

IEEE Signal Processing Society’s 2003 **Best Paper Award** for the article entitled *Wavelets, fractals, and radial basis functions* (with M. Unser) [77, journals]

IEEE Signal Processing Society’s 2006 **Best Paper Award** for the article entitled *Sampling signals with finite rate of innovation* (with M. Vetterli and P. Marziliano) [74, journals]

IEEE Signal Processing Society’s 2009 **Young Author Best Paper Award** for the article entitled *A new SURE approach to image denoising: Interscale orthonormal wavelet thresholding* (First author: F. Luisier) [51, journals]

ICIP’05 **Best Student Paper Award** for the article entitled *Beyond interpolation: Optimal reconstruction by quasi-interpolation* (First author: L. Condat) [85, conferences]

ICIP’16 **Best Paper Runner-Up Award** for the article entitled *Deconvolution of Poissonian Images with the PURE-LET Approach* (First author: J. Li) [25, conferences]

ISBI’17 **Best Student Paper Award (2nd place)** for the article entitled *PURE-LET Deconvolution of 3D Fluorescence Microscopy Images* (First author: J. Li) [23, conferences]

Outstanding Fellow of CUHK Faculty of Engineering (2019–2024)

TEACHING

- 1997–1999 Courses on wavelets for undergraduates at ENIC (New School for Communication Engineers in Lille, France)
- 2003–2007 *Signals and Systems* to Microengineering students and Life-Science students at EPFL
- 2008– ELEG4430 (*Digital Image Processing*), ELEG3310 (*Basic Electromagnetic Theory*), ENGG3910 (*Methodology of Research*), ENGG2011 (*Advanced Engineering Mathematics—Syllabus A*), ENGG2420 (*Complex Analysis and Differential Equations*), ENGG2720 (*Complex Variables for Engineers*) and BMEG3320 (*Biomedical Imaging*) to engineering undergraduate students at CUHK; MSc courses ELEG5742 (*Image Processing and Video Technology*) and BMEG5830 (*Medical Imaging*); Postgraduate course ELEG5060 (*Functional Analysis and Approximation Theory*)

GRADUATE STUDENTS

- 2021– Qi Dai, “High-Resolution Time-Frequency Analysis” (PhD–CUHK)
- 2021– Zihan Zhang, “Blind Source Separation” (PhD–CUHK)
- 2019– Zikai Sun, “Image Super-Resolution” (PhD–CUHK)
- 2018– Gang Luo, “Optical Diffraction Tomography” (PhD–CUHK) — Co-supervision with R. Zhou
- 2017–2021 Ruiming Guo, “Images from 1D signals” (PhD–CUHK)
- 2016–2020 Xiao Li, “Nonsmooth Nonconvex Optimization” (PhD–CUHK)
- 2016–2020 Xinxin Zhang, “Local All-Pass Parametric Image Registration” (PhD–CUHK)
- 2014–2018 Charlie, Jizhou Li, “Super-Resolution in Fluorescence Microscopy” (PhD–CUHK)
- 2013–2020 Harold, Tianle Zhao, “Steering Patterns” (PhD–CUHK)
- 2013–2018 Hanjie Pan, “Seeing Beyond Pixels: Theory, Algorithms and Applications of Continuous Sparse Recovery” (PhD–EPFL) — Co-supervision with M. Vetterli
- 2013–2017 Ruby, Lan Ma, “Towards EEG Microstate Analysis” (PhD–CUHK) — Co-supervision with W.S.Y. Wang
- 2011–2015 Zafer Doğan, “Wave Harmonic Sensing” (PhD–EPFL) — Co-supervision with D. Van De Ville
- 2011–2015 Manson, Cheuk Man Fong, “Brain-Computer Interface” (PhD–CUHK) — Co-supervision with W.S.Y. Wang

2011–2013	Hiu Fung Lee, “Edge Basis Functions” (MPhil–CUHK)
2010–2013	Hanjie Pan, “Algorithms for Sparse Image Restoration” (MPhil–CUHK)
2009–2013	Feng Xue, “Unbiased Risk Estimate Algorithms for Image Deconvolution” (PhD–CUHK)
2008–2011	Djano Kandaswamy, “Analytic Sensing of Electro-EncephaloGrams” (PhD–EPFL) — Co-supervision with D. Van De Ville
2008–2011	Matthew, Ka Lim Ma, “Denoising of Computer Tomography Images” (MPhil–CUHK)
2005–2009	Florian Luisier, “The SURE-LET Approach to Image Denoising” (PhD–EPFL) — Co-supervision with M. Unser

ADMINISTRATION

Feb. 2008–	Member of various committees of the EE Dept: <i>Computer Committee</i> (Chairman), <i>Research Committee</i> (Chairman), <i>Department Academic Personnel Committee</i> , <i>Non-Teaching Staff Review Panel</i> , <i>Curriculum Committee</i> , <i>Teaching & Learning Committee</i> (Vice-chairman), <i>Examination matters</i> , <i>Teaching Lab</i> , <i>Scholarship</i> , <i>Student Activities</i> , <i>Library Coordinator</i> ; and of the Faculty of Engineering: <i>Engineering Panel</i> , <i>Engineering Mathematics Subject Panel</i> , <i>Outstanding Thesis Award Selection Panel</i> .
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FUNDING

Feb. 2008–Feb. 2010	“Poisson noise reduction using an unbiased risk estimate: Application to biological image denoising”, PI, Direct Grant for Research ID# 2050420, HK\$ 150,000
Apr. 2008–Mar. 2011	“Analytic sensing: A new technique for EEG source imaging”, Co-I, SNF (Switzerland) doctoral grant #200021-119812/1, CHF 165,240 (HK\$ 1,137,204)
2009–2010	Sino-Swiss Grant with matching grant from the MS-CU-Joint Lab (CHF 4,500 + HK\$ 30,000) to finance three one-month visits to CUHK of Djano Kandaswamy
Oct. 2009–Sept. 2011	“Terahertz Probe for in Vivo Imaging”, PI (initial PI was Prof. E. McPherson), SHIAE #BME-p4-09, HK\$ 666,000
Jan. 2010–June 2013	“Non-Redundant Complex Wavelet Transform: Definition, Design and Implementation”, PI, RGC #CUHK410209, HK\$ 724,500
Jan. 2011–Dec. 2013	“Improved Algorithms for Finite Rate of Innovation Signals”, PI (with P.-L. Dragotti and M. Vetterli), RGC #CUHK410110, HK\$ 1,083,300
Jan. 2013–Dec. 2015	“Image restoration using unbiased risk estimates”, PI, RGC #CUHK410012, HK\$ 500,000
Sept. 2013–Feb. 2015	“Sparse and multiscale approaches to image alignment”, PI, Huawei, HK\$ 650,000
Jan. 2014–Dec. 2021	“Centre for Organelle Biogenesis and Function”, Co-I, RGC Area of Excellence, HK\$ 47,250,000
Nov. 2014–Oct. 2017	“Optimized image and volume interpolations”, PI, RGC #CUHK14200114, HK\$ 875,000
Jan. 2016–Dec. 2017	“FRI approximations”, PI, RGC #CUHK14600615, HK\$ 462,696
Apr. 2017–Dec. 2018	“Novel Total Internal Reflection THz Devices for High Speed Imaging”, PI (initial PI was Prof. E. McPherson), ITC #ITS/371/16, HK\$ 1,399,550
Jan. 2018–Dec. 2020	“Image Restoration from Binary Data Acquisition”, PI, RGC #CUHK14210617, HK\$ 495,846
Jan. 2018–Dec. 2020	“Novel TIR device for fast in vivo THz imaging”, PI (initial PI was Prof. E. McPherson), RGC #CUHK14206717, HK\$ 600,000
Jan. 2018–July 2019	“Develop Magnetic Resonance Imaging Technology for Fat-Water Imaging and Simultaneous $T_{1\rho}$ Quantification”, Co-I, ITC #ITS/051/17, HK\$ 1,395,789.50
Jan. 2019–Dec. 2021	“Local All-Pass Parametric Image Registration”, PI, RGC #CUHK14207718, HK\$ 700,000

PUBLICATIONS[†] (Updated on March 1, 2023)

Tutorial & Plenary Talks

- [1] T. Blu. Linear expansion of thresholds: A tool for approximating image processing algorithms. *Keynote Presentation at the ninth International Congress on Image and Signal Processing, BioMedical Engineering and Informatics (CISP-BMEI'16)*, Datong, China, October 15–17, 2016.
- [2] T. Blu. Image denoising and the SURE-LET methodology. *Tutorial Presentation at APSIPA Annual Summit and Conference 2010*, Singapore, December 14–17, 2010.
- [3] T. Blu. Sparsity through annihilation: Algorithms and applications. *Keynote Presentation at the Tenth IEEE International Conference on Signal Processing (ICSP'10)*, Beijing, China, October 24–28, 2010.
- [4] T. Blu and F. Luisier. Image denoising and the SURE-LET methodology. *Tutorial Presentation at the Seventeenth International Conference on Image Processing (ICIP'2010)*, Hong Kong, China, September 26–29, 2010.
- [5] M. Vetterli, P. Marziliano, T. Blu, and P.-L. Dragotti. Sparse sampling of structured data. *Tutorial Presentation at the Seventeenth European Signal Processing Conference (EUSIPCO'09)*, Glasgow, Scotland UK, August 24–28, 2009.
- [6] T. Blu. The SURE-LET methodology—A prior-free approach to signal and image denoising. *Plenary Presentation at the Eighth International Workshop on Sampling Theory and Applications (SampTA'09)*, Marseille, France, May 18–22, 2009.
- [7] M. Vetterli, P. Marziliano, T. Blu, and P.-L. Dragotti. Sparse sampling: Theory, algorithms and applications. *Tutorial Presentation at the Thirty-Fourth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'09)*, Taipei, Taiwan, April 19–24, 2009.

Patents

- [1] J.A. Urigüen, P.L. Dragotti, and T. Blu. Method and apparatus for sampling and reconstruction of signals. International patent WO/2014/191771, December 2014.
- [2] Qualcomm Inc., T. Blu, M. Vetterli, and L. Coulot. Sparse sampling of signal innovations. International patent WO/2009/096995, August 2009.
- [3] T. Blu, M. Unser, P. Thévenaz, and M. Sühling. Interpolation method and apparatus. International Patent WO2003021474, 2003.
- [4] M. Vetterli, P. Marziliano, and T. Blu. Sampling methods, reconstruction methods and devices for sampling and/or reconstructing signals. International Patent WO200278197, 2002. This technology was transferred to Qualcomm Inc. in 2007.

Book Chapters

- [1] T. Blu and J. Lebrun. Linear time-frequency analysis II: wavelet-type representations. In F. Hlawatsch and F. Auger, editors, *Time-Frequency Analysis - Concepts and Methods*, chapter 4, pages 93–130. Wiley-ISTE, London UK, 2008.
- [2] T. Blu and J. Lebrun. Analyse temps-fréquence linéaire II: représentations de type ondelettes. In F. Hlawatsch and F. Auger, editors, *Temps-fréquence, concepts et outils*, Traitement du Signal et de l'Image, chapter 4, pages 101–138. Hermès, Paris, France, 2005.
- [3] P. Thévenaz, T. Blu, and M. Unser. Image interpolation and resampling. In I.N. Bankman, editor, *Handbook of Medical Imaging, Processing and Analysis*, chapter 25, pages 393–420. Academic Press, San Diego CA, USA, 2000.

[†]Most papers are freely available at <http://www.ee.cuhk.edu.hk/~tblu/>

PhD Thesis

- [1] T. Blu. *Bancs de filtres itérés en fraction d'octave — Application au codage de son (Iterated Rational Filter Banks with an Application to Audio Coding)*. PhD thesis, ENST Paris, Nr. 96 E 009, 1996. in French.

Journal Papers

- [1] Y. Li, R. Guo, T. Blu, and H. Zhao. Generic FRI-based DOA estimation: A model-fitting method. *IEEE Transactions on Signal Processing*, 69:4102–4115, 2021.
- [2] R. Guo and T. Blu. Exploring the geometry of one-dimensional signals. *IEEE Transactions on Signal Processing*, 69:5299–5312, 2021.
- [3] R. Alexandru, T. Blu, and P.-L. Dragotti. Diffusion SLAM: Localising diffusion sources from samples taken by location-unaware mobile sensors. *IEEE Transactions on Signal Processing*, 69:5539–5554, 2021.
- [4] T. Küstner, J. Pan, H. Qi, G. Cruz, C. Gilliam, T. Blu, B. Yang, S. Gatidis, R. Botnar, and C. Prieto. LAPNet: Non-rigid registration derived in k-space for magnetic resonance imaging. *IEEE Transactions on Medical Imaging*, 40(12):3686–3697, December 2021.
- [5] R.I. Stantchev, X Yu, T. Blu, and E. Pickwell-MacPherson. Real-time terahertz imaging with a single-pixel detector. *Nature Communications*, 11(1):2535–2542, 21 May 2020.
- [6] R. Guo and T. Blu. FRI sensing: Retrieving the trajectory of a mobile sensor from its temporal samples. *IEEE Transactions on Signal Processing*, 68:5533–5545, 2020.
- [7] Q.Y.H. Ai, W. Chen, T.Y. So, W.K.J. Lam, B. Jiang, D.M.C. Poon, S. Qamar, F.K.F. Mo, T. Blu, Q. Chan, B.B.Y. Ma, E.P. Hui, K.C.A. Chan, and A.D. King. Quantitative T1 ρ MRI of the head and neck discriminates carcinoma and benign hyperplasia in the nasopharynx. *American Journal of Neuroradiology*, 2020.
- [8] T. Zhao and T. Blu. The Fourier-Argand representation: An optimal basis of steerable patterns. *IEEE Transactions on Image Processing*, 29(1):6357–6371, December 2020.
- [9] X. Zhang, C. Gilliam, and T. Blu. All-pass parametric image registration. *IEEE Transactions on Image Processing*, 29(1):5625–5640, December 2020.
- [10] B. Jiang, T. Jin, T. Blu, and W. Chen. Probing chemical exchange using quantitative spin-lock $R_{1\rho}$ asymmetry imaging with adiabatic RF pulses. *Magnetic Resonance in Medicine*, 82(5):1767–1781, November 2019.
- [11] J. Li, F. Xue, F. Qu, Y.-P. Ho, and T. Blu. On-the-fly estimation of a microscopy point spread function. *Optics Express*, 26(20):26120–26133, October 2018.
- [12] H. Pan, T. Blu, and M. Vetterli. Efficient multi-dimensional Diracs estimation with linear sample complexity. *IEEE Transactions on Signal Processing*, 66(17):4642–4656, September 2018.
- [13] C. Gilliam and T. Blu. Local All-Pass geometric deformations. *IEEE Transactions on Image Processing*, 27(2):1010–1025, February 2018.
- [14] J. Li, F. Luisier, and T. Blu. PURE-LET image deconvolution. *IEEE Transactions on Image Processing*, 27(1):92–105, January 2018.
- [15] H. Pan, M. Simeoni, P. Hurley, T. Blu, and M. Vetterli. LEAP: Looking beyond pixels with continuous-space Estimation of Point sources. *Astronomy & Astrophysics*, A&A 608:A136, 1–14, December 2017.
- [16] T. Küstner, M. Schwartz, P. Martirosian, S. Gatidis, F. Seith, C. Gilliam, T. Blu, H. Fayad, D. Visvikis, F. Schick, B. Yang, H. Schmidt, and N.F. Schwenzer. MR-based respiratory and cardiac motion correction for PET imaging. *Medical Image Analysis*, 42:129–144, December 2017.
- [17] J. Li, F. Xue, and T. Blu. Fast and accurate 3D PSF computation for fluorescence microscopy. *Journal of the Optical Society of America A*, 34(6):1029–1034, June 2017.
- [18] H. Pan, T. Blu, and M. Vetterli. Towards generalized FRI sampling with an application to source resolution in radioastronomy. *IEEE Transactions on Signal Processing*, 65(4):821–835, February 2017.

- [19] Z. Doğan, C. Gilliam, T. Blu, and D. Van De Ville. Reconstruction of finite rate of innovation signals with model-fitting approach. *IEEE Transactions on Signal Processing*, 63(22):6024–6036, November 2015.
- [20] F. Xue and T. Blu. A novel SURE-based criterion for parametric PSF estimation. *IEEE Transactions on Image Processing*, 24(2):595–607, February 2015.
- [21] Z. Doğan, T. Blu, and D. Van De Ville. Finite-rate-of-innovation for the inverse source problem of radiating fields. *Sampling Theory in Signal and Image Processing*, 13(3):271–294, 2014.
- [22] H. Pan, T. Blu, and P.-L. Dragotti. Sampling curves with finite rate of innovation. *IEEE Transactions on Signal Processing*, 62(2):458–471, January 2014.
- [23] J.A. Urigüen, T. Blu, and P.-L. Dragotti. FRI sampling with arbitrary kernels. *IEEE Transactions on Signal Processing*, 61(21):5310–5323, November 2013.
- [24] D. Kandaswamy, T. Blu, and D. Van De Ville. Analytic sensing for multi-layer spherical models with application to EEG source imaging. *Inverse Problems and Imaging*, 7(4):1251–1270, November 2013.
- [25] N. Chacko, M. Liebling, and T. Blu. Discretization of continuous convolution operators for accurate modeling of wave propagation in digital holography. *Journal of the Optical Society of America A*, 30(10):2012–2020, October 2013.
- [26] H. Pan and T. Blu. An iterative linear expansion of thresholds for ℓ_1 -based image restoration. *IEEE Transactions on Image Processing*, 22(9):3715–3728, September 2013.
- [27] F. Xue, F. Luisier, and T. Blu. Multi-Wiener SURE-LET deconvolution. *IEEE Transactions on Image Processing*, 22(5):1954–1968, May 2013.
- [28] F. Luisier, T. Blu, and P.J. Wolfe. A CURE for noisy magnetic resonance images: Chi-square unbiased risk estimation. *IEEE Transactions on Image Processing*, 21(8):3454–3466, August 2012.
- [29] E.P.J. Parrott, S.M.Y. Sy, T. Blu, V.P. Wallace, and E. Pickwell-MacPherson. Terahertz pulsed imaging in vivo: measurements and processing methods. *Journal of Biomedical Optics*, 16(10):106010 1–8, October 2011.
- [30] F. Luisier, T. Blu, and M. Unser. Image denoising in mixed Poisson-Gaussian noise. *IEEE Transactions on Image Processing*, 20(3):696–708, March 2011.
- [31] D. Van De Ville, B. Forster-Heinlein, M. Unser, and T. Blu. Analytical footprints: Compact representation of elementary singularities in wavelet bases. *IEEE Transactions on Signal Processing*, 58(12):6105–6118, December 2010.
- [32] J.P. Lie, T. Blu, and C.M.S. See. Single antenna power measurements based direction finding. *IEEE Transactions on Signal Processing*, 58(11):5682–5692, November 2010.
- [33] A.F. Stalder, T. Melchior, M. Müller, D. Sage, T. Blu, and M. Unser. Low-bond axisymmetric drop shape analysis for surface tension and contact angle measurements of sessile drops. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 364(1–3):72–81, July 2010.
- [34] F. Luisier, T. Blu, and M. Unser. SURE-LET for orthonormal wavelet-domain video denoising. *IEEE Transactions on Circuits and Systems for Video Technology*, 20(6):913–919, June 2010.
- [35] F. Luisier, C. Vonesch, T. Blu, and M. Unser. Fast interscale wavelet denoising of Poisson-corrupted images. *Signal Processing*, 90(2):415–427, February 2010.
- [36] J. Berent, P.-L. Dragotti, and T. Blu. Sampling piecewise sinusoidal signals with finite rate of innovation methods. *IEEE Transactions on Signal Processing*, 58(2):613–625, February 2010.
- [37] D. Kandaswamy, T. Blu, and D. Van De Ville. Analytic sensing: Noniterative retrieval of point sources from boundary measurements. *SIAM Journal on Scientific Computing*, 31(4):3179–3194, 2009.
- [38] J.-M. Mari, T. Blu, O. Bou Matar, M. Unser, and C. Cachard. A bulk modulus dependent linear model for acoustical imaging. *Journal of the Acoustical Society of America*, 125(4):2413–2419, April 2009.
- [39] Y. Barbotin, D. Van De Ville, T. Blu, and M. Unser. Fast computation of polyharmonic B-Spline autocorrelation filters. *IEEE Signal Processing Letters*, 15:773–776, 2008.

- [40] S. Ramani, T. Blu, and M. Unser. Monte-Carlo SURE: A black-box optimization of regularization parameters for general denoising algorithms. *IEEE Transactions on Image Processing*, 17(9):1540–1554, September 2008.
- [41] B. Forster, T. Blu, D. Van De Ville, and M. Unser. Shift-invariant spaces from rotation-covariant functions. *Applied and Computational Harmonic Analysis*, 25(2):240–265, September 2008.
- [42] F. Luisier and T. Blu. SURE-LET multichannel image denoising: Interscale orthonormal wavelet thresholding. *IEEE Transactions on Image Processing*, 17(4):482–492, April 2008.
- [43] S. Ramani, D. Van De Ville, T. Blu, and M. Unser. Nonideal sampling and regularization theory. *IEEE Transactions on Signal Processing*, 56(3):1055–1070, March 2008.
- [44] T. Blu, P.-L. Dragotti, M. Vetterli, P. Marziliano, and L. Coulot. Sparse sampling of signal innovations. *IEEE Signal Processing Magazine*, 25(2):31–40, March 2008.
- [45] T. Blu and F. Luisier. The SURE-LET approach to image denoising. *IEEE Transactions on Image Processing*, 16(11):2778–2786, November 2007.
- [46] D. Van De Ville, M.L. Seghier, F. Lazeyras, T. Blu, and M. Unser. WSPM: Wavelet-based statistical parametric mapping. *NeuroImage*, 37(4):1205–1217, October 1, 2007.
- [47] C. Vonesch, T. Blu, and M. Unser. Generalized Daubechies wavelet families. *IEEE Transactions on Signal Processing*, 55(9):4415–4429, September 2007.
- [48] P.-L. Dragotti, M. Vetterli, and T. Blu. Sampling moments and reconstructing signals of finite rate of innovation: Shannon meets Strang-Fix. *IEEE Transactions on Signal Processing*, 55(5):1741–1757, May 2007. Part 1.
- [49] M. Unser and T. Blu. Self-similarity: Part I—Splines and operators. *IEEE Transactions on Signal Processing*, 55(4):1352–1363, April 2007.
- [50] T. Blu and M. Unser. Self-similarity: Part II—Optimal estimation of fractal processes. *IEEE Transactions on Signal Processing*, 55(4):1364–1378, April 2007.
- [51] F. Luisier, T. Blu, and M. Unser. A new SURE approach to image denoising: Interscale orthonormal wavelet thresholding. *IEEE Transactions on Image Processing*, 16(3):593–606, March 2007. IEEE Signal Processing Society’s 2009 **Young Author Best Paper Award**.
- [52] B. Bathellier, D. Van De Ville, T. Blu, M. Unser, and A. Carleton. Wavelet-based multi-resolution statistics for optical imaging signals: Application to automated detection of odour activated glomeruli in the mouse olfactory bulb. *NeuroImage*, 34(3):1020–1035, February 1, 2007.
- [53] P. Marziliano, M. Vetterli, and T. Blu. Sampling and exact reconstruction of bandlimited signals with additive shot noise. *IEEE Transactions on Information Theory*, 52(5):2230–2233, May 2006.
- [54] D. Van De Ville, T. Blu, and M. Unser. Surfing the brain—An overview of wavelet-based techniques for fMRI data analysis. *IEEE Engineering in Medicine and Biology Magazine*, 25(2):65–78, March–April 2006.
- [55] B. Forster, T. Blu, and M. Unser. Complex B-Splines. *Applied and Computational Harmonic Analysis*, 20(2):261–282, March 2006.
- [56] M. Jacob, T. Blu, C. Vaillant, J.H. Maddocks, and M. Unser. 3-D shape estimation of DNA molecules from stereo cryo-electron micro-graphs using a projection-steerable snake. *IEEE Transactions on Image Processing*, 15(1):214–227, January 2006.
- [57] D. Van De Ville, T. Blu, and M. Unser. Isotropic polyharmonic B-Splines: Scaling functions and wavelets. *IEEE Transactions on Image Processing*, 14(11):1798–1813, November 2005.
- [58] F. Precioso, M. Barlaud, T. Blu, and M. Unser. Robust real-time segmentation of images and videos using a smooth-spline snake-based algorithm. *IEEE Transactions on Image Processing*, 14(7):910–924, July 2005.
- [59] M. Unser and T. Blu. Generalized smoothing splines and the optimal discretization of the Wiener filter. *IEEE Transactions on Signal Processing*, 53(6):2146–2159, June 2005.
- [60] M. Unser and T. Blu. Cardinal exponential splines: Part I—Theory and filtering algorithms. *IEEE Transactions on Signal Processing*, 53(4):1425–1438, April 2005.

- [61] D. Van De Ville, T. Blu, and M. Unser. On the multidimensional extension of the quincunx sub-sampling matrix. *IEEE Signal Processing Letters*, 12(2):112–115, February 2005.
- [62] D. Van De Ville, T. Blu, and M. Unser. Integrated wavelet processing and spatial statistical testing of fMRI data. *NeuroImage*, 23(4):1472–1485, December 2004.
- [63] M. Jacob, T. Blu, and M. Unser. Efficient energies and algorithms for parametric snakes. *IEEE Transactions on Image Processing*, 13(9):1231–1244, September 2004.
- [64] D. Van De Ville, T. Blu, M. Unser, W. Philips, I. Lemahieu, and R. Van de Walle. Hex-splines: A novel spline family for hexagonal lattices. *IEEE Transactions on Image Processing*, 13(6):758–772, June 2004.
- [65] T. Blu, P. Thévenaz, and M. Unser. Linear interpolation revitalized. *IEEE Transactions on Image Processing*, 13(5):710–719, May 2004.
- [66] M. Liebling, T. Blu, and M. Unser. Complex-wave retrieval from a single off-axis hologram. *Journal of the Optical Society of America A*, 21(3):367–377, March 2004.
- [67] T. Blu, P. Thévenaz, and M. Unser. Complete parameterization of piecewise-polynomial interpolation kernels. *IEEE Transactions on Image Processing*, 12(11):1297–1309, November 2003.
- [68] M. Unser and T. Blu. Mathematical properties of the JPEG2000 wavelet filters. *IEEE Transactions on Image Processing*, 12(9):1080–1090, September 2003.
- [69] M. Unser and T. Blu. Wavelet theory demystified. *IEEE Transactions on Signal Processing*, 51(2):470–483, February 2003.
- [70] M. Liebling, T. Blu, and M. Unser. Fresnelets: New multiresolution wavelet bases for digital holography. *IEEE Transactions on Image Processing*, 12(1):29–43, January 2003.
- [71] K. Ichige, T. Blu, and M. Unser. A study on spline functions and their applications to digital signal and image processing. *The Telecommunications Advancement Foundation*, 18(7(1)):358–365, January 2003.
- [72] J. Kybic, T. Blu, and M. Unser. Generalized sampling: A variational approach—Part II: Applications. *IEEE Transactions on Signal Processing*, 50(8):1977–1985, August 2002.
- [73] J. Kybic, T. Blu, and M. Unser. Generalized sampling: A variational approach—Part I: Theory. *IEEE Transactions on Signal Processing*, 50(8):1965–1976, August 2002.
- [74] M. Vetterli, P. Marziliano, and T. Blu. Sampling signals with finite rate of innovation. *IEEE Transactions on Signal Processing*, 50(6):1417–1428, June 2002. **IEEE Signal Processing Society’s 2006 Best Paper Award.**
- [75] A. Muñoz Barrutia, T. Blu, and M. Unser. ℓ_p -Multiresolution analysis: How to reduce ringing and sparsify the error. *IEEE Transactions on Image Processing*, 11(6):656–669, June 2002.
- [76] M. Jacob, T. Blu, and M. Unser. Sampling of periodic signals: A quantitative error analysis. *IEEE Transactions on Signal Processing*, 50(5):1153–1159, May 2002.
- [77] T. Blu and M. Unser. Wavelets, fractals, and radial basis functions. *IEEE Transactions on Signal Processing*, 50(3):543–553, March 2002. **IEEE Signal Processing Society’s 2003 Best Paper Award.**
- [78] A. Muñoz Barrutia, T. Blu, and M. Unser. Least-squares image resizing using finite differences. *IEEE Transactions on Image Processing*, 10(9):1365–1378, September 2001.
- [79] T. Blu, P. Thévenaz, and M. Unser. MOMS: Maximal-order interpolation of minimal support. *IEEE Transactions on Image Processing*, 10(7):1069–1080, July 2001.
- [80] M. Jacob, T. Blu, and M. Unser. An exact method for computing the area moments of wavelet and spline curves. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 23(6):633–642, June 2001.
- [81] P. Thévenaz, T. Blu, and M. Unser. Interpolation revisited. *IEEE Transactions on Medical Imaging*, 19(7):739–758, July 2000.
- [82] M. Unser and T. Blu. Fractional splines and wavelets. *SIAM Review*, 42(1):43–67, March 2000.
- [83] T. Blu and M. Unser. Quantitative Fourier analysis of approximation techniques: Part II—Wavelets. *IEEE Transactions on Signal Processing*, 47(10):2796–2806, October 1999.

- [84] T. Blu and M. Unser. Quantitative Fourier analysis of approximation techniques: Part I—Interpolators and projectors. *IEEE Transactions on Signal Processing*, 47(10):2783–2795, October 1999.
- [85] T. Blu and M. Unser. Approximation error for quasi-interpolators and (multi-) wavelet expansions. *Applied and Computational Harmonic Analysis*, 6(2):219–251, March 1999.
- [86] P. Blanc, T. Blu, T. Ranchin, L. Wald, and R. Aloisi. Using iterated rational filter banks within the ARSIS concept for producing 10 m Landsat multispectral images. *International Journal of Remote Sensing*, 19(12):2331–2343, August 1998.
- [87] T. Blu. A new design algorithm for two-band orthonormal rational filter banks and orthonormal rational wavelets. *IEEE Transactions on Signal Processing*, 46(6):1494–1504, June 1998.
- [88] T. Blu. Iterated filter banks with rational rate changes—Connection with discrete wavelet transforms. *IEEE Transactions on Signal Processing*, 41(12):3232–3244, December 1993.

Conferences Papers & Abstracts

- [1] Z. Sun, Z. Zhang, and T. Blu. An algebraic optimization approach to image registration. In *Proceedings of the 2022 IEEE International Conference on Image Processing (ICIP'22)*, Bordeaux, France, October 16–19, 2022. To appear.
- [2] Z. Zhang and T. Blu. Blind source separation via a weak exclusion principle. In *Proceedings of the Forty-seventh IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'22)*, Singapore, May 22–27, 2022. To appear.
- [3] Z. Sun and T. Blu. A nonlinear steerable complex wavelet decomposition of images. In *Proceedings of the Forty-seventh IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'22)*, Singapore, May 22–27, 2022. To appear.
- [4] R. Alexandru, T. Blu, and P.-L. Dragotti. Localising diffusion sources from samples taken along unknown parametric trajectories. In *Proceedings of the Twenty-Ninth European Signal Processing Conference (EUSIPCO)*, pages 2199–2203, Dublin, Ireland, August 23–27 2021.
- [5] T. Küstner, J. Pan, C. Gilliam, H. Qi, G. Cruz, K. Hammernik, B. Yang, T. Blu, D. Rueckert, R. Botnar, C. Prieto, and S. Gatidis. Deep-learning based motion-corrected image reconstruction in 4D magnetic resonance imaging of the body trunk. In *Proceedings of the 2020 Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA ASC)*, pages 976–985, Auckland, NZ, December 7–10 2020.
- [6] R. Guo and T. Blu. FRI sensing: 2D localization from 1D mobile sensor data. In *Proceedings of the 2020 Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA ASC)*, pages 986–991, Auckland, NZ, December 7–10 2020.
- [7] F. Xue and T. Blu. On the degrees of freedom in total variation minimization. In *Proceedings of the Forty-fifth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'20)*, pages 5690–5694, Barcelona, Spain, May 4–8, 2020.
- [8] R. Alexandru, T. Blu, and P.-L. Dragotti. D-SLAM: Diffusion source localization and trajectory mapping. In *Proceedings of the Forty-fifth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'20)*, pages 5600–5604, Barcelona, Spain, May 4–8, 2020.
- [9] T. Zhao and T. Blu. Detecting curves in very noisy images using Fourier-Argand moments. In *Proceedings of the 2019 IEEE International Conference on Image Processing (ICIP'19)*, pages 3011–3015, Taipei, Taiwan, September 22–25, 2019.
- [10] X. Zhang, C. Gilliam, and T. Blu. Parametric registration for mobile phone images. In *Proceedings of the 2019 IEEE International Conference on Image Processing (ICIP'19)*, pages 1312–1316, Taipei, Taiwan, September 22–25, 2019.
- [11] X. Xue, J. Li, and T. Blu. An iterative sure-let deconvolution algorithm based on bm3d denoiser. In *Proceedings of the 2019 IEEE International Conference on Image Processing (ICIP'19)*, pages 1795–1799, Taipei, Taiwan, September 22–25, 2019.
- [12] T. Jayashankar, P. Moulin, T. Blu, and C. Gilliam. LAP-based video frame interpolation. In *Proceedings of the 2019 IEEE International Conference on Image Processing (ICIP'19)*, pages 4195–4199, Taipei, Taiwan, September 22–25, 2019.

- [13] R. Guo and T. Blu. FRI sensing: Sampling images along unknown curves. In *Proceedings of the Forty-fourth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'19)*, pages 5132–5136, Brighton, UK, March 12–17 2019.
- [14] D. Batenkov, A. Bhandari, and T. Blu. Rethinking super-resolution: The bandwidth selection problem. In *Proceedings of the Forty-fourth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'19)*, pages 5087–5091, Brighton, UK, March 12–17, 2019.
- [15] R.I. Stantchev, T. Blu, and E. Pickwell-Macpherson. Total internal reflection THz devices for high speed imaging. In *Proceedings of the 2018 43rd International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz)*, Nagoya, Japan, September 9–14, 2018.
- [16] F. Xue, T. Blu, J. Liu, and A. Xia. Recursive evaluation of SURE for total variation denoising. In *Proceedings of the Forty-third IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'18)*, pages 1338–1342, Calgary, AB, Canada, April 15–20, 2018.
- [17] F. Xue, T. Blu, J. Liu, and A. Xia. A novel GCV-based criterion for parameter selection in image deconvolution. In *Proceedings of the Forty-third IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'18)*, pages 1403–1407, Calgary, AB, Canada, April 15–20, 2018.
- [18] J. Li, F. Xue, and T. Blu. Accurate 3D PSF estimation from a wide-field microscopy image. In *Proceedings of the Fifteenth IEEE International Symposium on Biomedical Imaging (ISBI'18)*, pages 501–504, Washington, DC, USA, April 4–7, 2018.
- [19] C. Gilliam, A. Bingham, T. Blu, and B. Jelfs. Time-varying delay estimation using common local all-pass filters with application to surface electromyography. In *Proceedings of the Forty-third IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'18)*, pages 841–845, Calgary, AB, Canada, April 15–20, 2018.
- [20] X. Zhang, C. Gilliam, and T. Blu. Iterative fitting after elastic registration: An efficient strategy for accurate estimation of parametric deformations. In *Proceedings of the 2017 IEEE International Conference on Image Processing (ICIP'17)*, pages 1492–1496, Beijing, China, September 17–20, 2017.
- [21] J. Li, F. Xue, and T. Blu. Gaussian blur estimation for photon-limited images. In *Proceedings of the 2017 IEEE International Conference on Image Processing (ICIP'17)*, pages 495–497, Beijing, China, September 17–20, 2017.
- [22] L. Ma, T. Blu, and W.S.Y. Wang. Event-related potentials source separation based on a weak exclusion principle. In *Proceedings of the Fourteenth IEEE International Symposium on Biomedical Imaging (ISBI'17)*, pages 1011–1014, Melbourne, Australia, April 18–21, 2017.
- [23] J. Li, F. Luisier, and T. Blu. PURE-LET deconvolution of 3D fluorescence microscopy images. In *Proceedings of the Fourteenth IEEE International Symposium on Biomedical Imaging (ISBI'17)*, pages 723–727, Melbourne, Australia, April 18–21, 2017. **Best student paper award (2nd place)**.
- [24] A. Bhandari and T. Blu. FRI sampling and time-varying pulses: Some theory and four short stories. In *Proceedings of the Forty-second IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'17)*, pages 3804–3808, New Orleans, LA, USA, March 5–9, 2017.
- [25] J. Li, F. Luisier, and T. Blu. Deconvolution of Poissonian images with the PURE-LET approach. In *Proceedings of the 2016 IEEE International Conference on Image Processing (ICIP'16)*, pages 2708–2712, Phoenix, AZ, USA, September 25–28, 2016. **Best Paper Runner-Up Award**.
- [26] L. Ma, T. Blu, and W.S.Y. Wang. An EEG blind source separation algorithm based on a weak exclusion principle. In *Proceedings of the 38th International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'16)*, pages 859–862, Orlando, FL, USA, August 16–20, 2016.
- [27] C. Gilliam, T. Küstner, and T. Blu. 3D motion flow estimation using local all-pass filters. In *Proceedings of the Thirteenth IEEE International Symposium on Biomedical Imaging (ISBI'16)*, pages 282–285, Prague, Czech Republic, April 13–16, 2016.
- [28] F. Xue, T. Blu, R. Du, and J. Liu. An iterative SURE-LET approach to sparse reconstruction. In *Proceedings of the Forty-first IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'16)*, pages 4493–4497, Shanghai, China, March 20–25, 2016.

- [29] C. Gilliam and T. Blu. Finding the minimum rate of innovation in the presence of noise. In *Proceedings of the Forty-first IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'16)*, pages 4019–4023, Shanghai, China, March 20–25, 2016.
- [30] J. Li, C. Gilliam, and T. Blu. A multi-frame optical flow spot tracker. In *Proceedings of the 2015 IEEE International Conference on Image Processing (ICIP'15)*, pages 3670–3674, Québec City, Canada, September 27–30, 2015.
- [31] T. Blu, P. Moulin, and C. Gilliam. Approximation order of the LAP optical flow algorithm. In *Proceedings of the 2015 IEEE International Conference on Image Processing (ICIP'15)*, pages 48–52, Québec City, Canada, September 27–30, 2015.
- [32] L Ma, J.W. Minett, T. Blu, and W.S.Y. Wang. Resting state EEG-based biometrics for individual identification using convolutional neural networks. In *Proceedings of the 37th International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'15)*, pages 2848–2851, Milano, Italy, August 25–29, 2015.
- [33] H. Pan, T. Blu, and M. Vetterli. Annihilation-driven localised image edge models. In *Proceedings of the Fortieth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'15)*, pages 5977–5981, Brisbane, Australia, April 19–24, 2015.
- [34] C. Gilliam and T. Blu. Local all-pass filters for optical flow estimation. In *Proceedings of the Fortieth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'15)*, pages 1533–1537, Brisbane, Australia, April 19–24, 2015.
- [35] M. C. M. Fong, J. W. Minett, T. Blu, and W. S. Y. Wang. Towards a neural measure of perceptual distance—classification of electroencephalographic responses to synthetic vowels. In *Proceedings of the Fifteenth Annual Conference of the International Speech Communication Association (Inter-speech 2014)*, pages 2595–2599, Singapore, 14–18 September, 2014.
- [36] B.K. Panisetti, T. Blu, and C.S. Seelamantula. An unbiased risk estimator for multiplicative noise—application to 1-D signal denoising. In *Proceedings of the Nineteenth International Conference on Digital Signal Processing (DSP'14)*, pages 497–502, Hong Kong, China, August 20–23, 2014.
- [37] C. Gilliam and T. Blu. Fitting instead of annihilation: Improved recovery of noisy FRI signals. In *Proceedings of the Thirty-ninth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'14)*, pages 51–55, Florence, Italy, May 4–9, 2014.
- [38] Z. Doğan, I. Jovanovic, T. Blu, and D. Van De Ville. Localization of point sources in wave fields from boundary measurements using new sensing principle. In *Proceedings of the Tenth International Workshop on Sampling Theory and Applications (SampTA'13)*, pages 321–324, Bremen, Germany, July 1–5, 2013.
- [39] L. Wei and T. Blu. Construction of an orthonormal complex multiresolution analysis. In *Proceedings of the Thirty-eighth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'13)*, pages 2381–2385, Vancouver, Canada, May 26–31, 2013.
- [40] Z. Doğan, T. Blu, and D. Van De Ville. Eigensensing and deconvolution for the reconstruction of heat absorption profiles from photoacoustic tomography data. In *Proceedings of the Tenth IEEE International Symposium on Biomedical Imaging (ISBI'13)*, pages 1142–1145, San Francisco, USA, April 7–11, 2013.
- [41] Z. Doğan, I. Jovanovic, T. Blu, and D. Van De Ville. Application of a new sensing principle for photoacoustic imaging of point absorbers. In *SPIE BiOS Photons Plus Ultrasound: Imaging and Sensing 2013. Proceedings of the SPIE.*, volume 8581, pages 8581–144P1–7, San Francisco, USA, February 2–7, 2013.
- [42] F. Xue, F. Luisier, and T. Blu. SURE-LET image deconvolution using multiple Wiener filters. In *Proceedings of the 2012 IEEE International Conference on Image Processing (ICIP'12)*, pages 3037–3040, Orlando, USA, September 30–October 3, 2012.
- [43] F. Xue and T. Blu. SURE-based motion estimation. In *Proceedings of the IEEE International Conference on Signal Processing, Communications and Computing (ICSPCC'12)*, pages 373–377, Hong Kong, China, August 12–15, 2012.
- [44] F. Xue and T. Blu. SURE-based blind Gaussian deconvolution. In *Proceedings of the IEEE Statistical Signal Processing Workshop (SSP)*, pages 452–455, Ann Arbor, USA, August 5–8, 2012.

- [45] X. Wei, T. Blu, and P.-L. Dragotti. Finite rate of innovation with non-uniform samples. In *Proceedings of the IEEE International Conference on Signal Processing, Communications and Computing (ICSPCC'12)*, pages 369–372, Hong Kong, China, August 12–15, 2012.
- [46] L. Wei and T. Blu. A new non-redundant complex Hilbert wavelet transforms. In *Proceedings of the IEEE Statistical Signal Processing Workshop (SSP)*, pages 652–655, Ann Arbor, USA, August 5–8, 2012.
- [47] M. C. M. Fong, J. W. Minett, T. Blu, and W. S. Y. Wang. Brain-computer interface (BCI): Is it strictly necessary to use random sequences in visual spellers? In *Proceedings of the tenth Asia Pacific Conference on Computer Human Interaction (APCHI 2012)*, pages 109–118, Matsue, Japan, August 28–31, 2012.
- [48] Z. Doğan, I. Jovanovic, T. Blu, and D. Van De Ville. 3D reconstruction of wave-propagated point sources from boundary measurements using joint sparsity and finite rate of innovation. In *Proceedings of the Ninth IEEE International Symposium on Biomedical Imaging (ISBI'12)*, pages 1575–1578, Barcelona, Spain, May 2–5, 2012.
- [49] J.P. Lie, T. Blu, and C.M.S. See. Single antenna power measurements based direction finding with incomplete spatial coverage. In *Proceedings of the Thirty-seventh IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'12)*, pages 2641–2644, Kyoto, Japan, March 25–30, 2012.
- [50] H. Pan and T. Blu. Sparse image restoration using iterated linear expansion of thresholds. In *Proceedings of the 2011 IEEE International Conference on Image Processing (ICIP'11)*, pages 1905–1908, Brussels, Belgium, September 11–14, 2011.
- [51] H. Lakshman, H. Schwartz, T. Blu, and T. Wiegand. Generalized interpolation for motion compensated prediction. In *Proceedings of the 2011 IEEE International Conference on Image Processing (ICIP'11)*, pages 1213–1216, Brussels, Belgium, September 11–14, 2011.
- [52] Z. Doğan, V. Tsiminaki, I. Jovanovic, T. Blu, and D. Van De Ville. Localization of point sources for systems governed by the wave equation. In *Wavelets and Sparsity XIV. Proceedings of the SPIE*, volume 8138, pages 81380P1–11, San Diego, USA, August 21–24, 2011.
- [53] J.A. Urigüen, P.-L. Dragotti, and T. Blu. On the exponential reproducing kernels for sampling signals with finite rate of innovation. In *Proceedings of the Ninth International Workshop on Sampling Theory and Applications (SampTA'11)*, Singapore, May 2–6, 2011.
- [54] H. Pan, T. Blu, and P.-L. Dragotti. Sampling curves with finite rate of innovation. In *Proceedings of the Ninth International Workshop on Sampling Theory and Applications (SampTA'11)*, Singapore, May 2–6, 2011.
- [55] J.P. Lie, T. Blu, and C.M.S. See. Azimuth-elevation direction finding using power measurements from single antenna. In *Proceedings of the Thirty-sixth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'11)*, pages 2608–2611, Prague, Czech Republic, May 22–27, 2011.
- [56] D. Kandaswamy, T. Blu, L. Spinelli, C. Michel, and D. Van De Ville. Local multilayer analytic sensing for EEG source localization: Performance bounds and experimental results. In *Proceedings of the Eighth IEEE International Symposium on Biomedical Imaging (ISBI'11)*, pages 479–483, Chicago, USA, March 30–April 2, 2011.
- [57] N. Zheng, X. Li, T. Blu, and T. Lee. SURE-MSE speech enhancement for robust speech recognition. In *Proceedings of the 2010 International Symposium on Chinese Spoken Language Processing (ISCSLP'10)*, pages 271–274, Tainan, Taiwan, November 29–December 3, 2010.
- [58] M. Wang and T. Blu. Generalized YUV interpolation of CFA images. In *Proceedings of the 2010 IEEE International Conference on Image Processing (ICIP'10)*, pages 1909–1912, Hong Kong, China, September 26–29, 2010.
- [59] F. Luisier, T. Blu, and M. Unser. Undecimated Haar thresholding for Poisson intensity estimation. In *Proceedings of the 2010 IEEE International Conference on Image Processing (ICIP'10)*, pages 1697–1700, Hong Kong, China, September 26–29, 2010.
- [60] F. Luisier, C. Vonesch, T. Blu, and M. Unser. Fast haar-wavelet denoising of multidimensional fluorescence microscopy data. In *Proceedings of the Sixth IEEE International Symposium on Biomedical Imaging (ISBI'09)*, Boston, USA, June 28–July 1, 2009.

- [61] T. Blu. The generalized annihilation property—a tool for solving finite rate of innovation problems. In *Proceedings of the Eighth International Workshop on Sampling Theory and Applications (SampTA'09)*, Marseille, France, May 18–22, 2009.
- [62] S. Bergner, D. Van De Ville, T. Blu, and T. Möller. On sampling lattices with similarity scaling relationships. In *Proceedings of the Eighth International Workshop on Sampling Theory and Applications (SampTA'09)*, Marseille, France, May 18–22, 2009.
- [63] D. Kandaswamy, T. Blu, L. Spinelli, C. Michel, and D. Van De Ville. EEG source localization by multi-planar analytic sensing. In *Proceedings of the Fifth IEEE International Symposium on Biomedical Imaging (ISBI'08)*, pages 1075–1078, Paris, France, May 14–17, 2008.
- [64] S. Delpretti, F. Luisier, S. Ramani, T. Blu, and M. Unser. Multiframe SURE-LET denoising of timelapse fluorescence microscopy images. In *Proceedings of the Fifth IEEE International Symposium on Biomedical Imaging (ISBI'08)*, pages 149–152, Paris, France, May 14–17, 2008.
- [65] S. Ramani, T. Blu, and M. Unser. Blind optimization of algorithm parameters for signal denoising by Monte-Carlo SURE. In *Proceedings of the Thirty-Third IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'08)*, pages 905–908, Las Vegas, USA, March 30–April 4, 2008.
- [66] F. Luisier and T. Blu. SURE-LET multichannel image denoising: Undecimated wavelet thresholding. In *Proceedings of the Thirty-Third IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'08)*, pages 769–772, Las Vegas, USA, March 30–April 4, 2008.
- [67] P. Thévenaz, T. Blu, and M. Unser. Short basis functions for constant-variance interpolation. In J.M. Reinhardt and J.P.W. Pluim, editors, *Proceedings of the SPIE International Symposium on Medical Imaging: Image Processing (MI'08)*, volume 6914, pages 69142L–1–69142L–8, San Diego, USA, February 16–21, 2008.
- [68] F. Luisier and T. Blu. SURE-LET interscale-intercolor wavelet thresholding for color image denoising. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet XII*, volume 6701, pages 67011H–1–67011H–10, San Diego, USA, August 26–29, 2007.
- [69] I. Khalidov, D. Van De Ville, T. Blu, and M. Unser. Construction of wavelet bases that mimic the behaviour of some given operator. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet XII*, volume 6701, pages 67010S–1–67010S–7, San Diego, USA, August 26–29, 2007.
- [70] D. Kandaswamy, T. Blu, and D. Van De Ville. Analytic sensing: Direct recovery of point sources from planar Cauchy boundary measurements. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet XII*, volume 6701, pages 67011Y–1–67011Y–6, San Diego, USA, August 26–29, 2007.
- [71] D. Van De Ville, M. Seghier, F. Lazeyras, T. Blu, and M. Unser. Empirical sensitivity, specificity, and bias of wavelet-based statistical parametric mapping (WSPM). In *Thirteenth Annual Meeting of the Organization for Human Brain Mapping (HBM'07)*, Chicago, USA, June 10–14, 2007. CD-ROM paper no. 336 TH PM.
- [72] D. Van De Ville, B. Bathellier, A. Carleton, T. Blu, and M. Unser. Wavelet-based statistical analysis for optical imaging in mouse olfactory bulb. In *Proceedings of the Fourth IEEE International Symposium on Biomedical Imaging (ISBI'07)*, pages 448–451, Arlington, USA, April 12–15, 2007.
- [73] S.C. Sekhar, H. Nazkani, T. Blu, and M. Unser. A new technique for high-resolution frequency domain optical coherence tomography. In *Proceedings of the Thirty-Second IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'07)*, pages I–425–I–428, Honolulu, USA, April 15–20, 2007.
- [74] S.C. Sekhar, R.A. Leitgeb, M.L. Villiger, A.H. Bachmann, T. Blu, and M. Unser. Non-iterative exact signal recovery in frequency domain optical coherence tomography. In *Proceedings of the Fourth IEEE International Symposium on Biomedical Imaging (ISBI'07)*, pages 808–811, Arlington, USA, April 12–15, 2007.
- [75] F. Luisier and T. Blu. Image denoising by pointwise thresholding of the undecimated wavelet coefficients: A global SURE optimum. In *Proceedings of the Thirty-Second IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'07)*, pages I–593–I–596, Honolulu, USA, April 15–20, 2007.

- [76] D. Van De Ville, M. Seghier, F. Lazeyras, T. Blu, and M. Unser. Wavelet-based statistical analysis of fMRI data with high spatial resolution. In *CHUV Research Day (CHUV'07)*, page 185, Lausanne, Switzerland, February 1, 2007.
- [77] F. Luisier, T. Blu, and M. Unser. SURE-based wavelet thresholding integrating inter-scale dependencies. In *Proceedings of the 2006 IEEE International Conference on Image Processing (ICIP'06)*, pages 1457–1460, Atlanta, USA, October 8–11, 2006.
- [78] D. Van De Ville, T. Blu, B. Forster, and M. Unser. Polyharmonic B-Spline wavelets: From isotropy to directionality. In *Advanced Concepts for Intelligent Vision Systems (ACIVS'06)*, Antwerp, Belgium, September 18–21, 2006. Invited talk.
- [79] D. Van De Ville, M. Seghier, F. Lazeyras, M. Pelizzone, T. Blu, and M. Unser. SPM versus WSPM: Sensitivity and specificity for multi-session fMRI data. In *Twelfth Annual Meeting of the Organization for Human Brain Mapping (HBM'06)*, page S94, Florence, Italy, June 11–15, 2006. Invited talk.
- [80] D. Van De Ville, T. Blu, and M. Unser. WSPM or how to obtain statistical parametric maps using shift-invariant wavelet processing. In *Proceedings of the IEEE Thirty-First International Conference on Acoustics, Speech, and Signal Processing (ICASSP'06)*, pages V–1101–V–1104, Toulouse, France, May 14–19, 2006.
- [81] D. Van De Ville, B. Bathellier, R. Accolla, A. Carleton, T. Blu, and M. Unser. Wavelet-based detection of stimulus responses in time-lapse microscopy. In *Proceedings of the Thirty-First IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'06)*, pages V–1161–V–1164, Toulouse, France, May 14–19, 2006.
- [82] T. Blu and M. Unser. Optimal interpolation of fractional Brownian motion given its noisy samples. In *Proceedings of the Thirty-First IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'06)*, pages III–860–III–863, Toulouse, France, May 14–19, 2006.
- [83] Y. Hao, P. Marziliano, M. Vetterli, and T. Blu. Compression of ECG as a signal with finite rate of innovation. In *Proceedings of the Twenty-Seventh Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS'05)*, pages 7564–7567, Shanghai, China, September 1–4, 2005.
- [84] L. Condat, D. Van De Ville, and T. Blu. Hexagonal versus orthogonal lattices: A new comparison using approximation theory. In *Proceedings of the 2005 IEEE International Conference on Image Processing (ICIP'05)*, volume III, pages 1116–1119, Genova, Italy, September 11–14, 2005.
- [85] L. Condat, T. Blu, and M. Unser. Beyond interpolation: Optimal reconstruction by quasi-interpolation. In *Proceedings of the 2005 IEEE International Conference on Image Processing (ICIP'05)*, volume I, pages 33–36, Genova, Italy, September 11–14, 2005. **Best Student Paper Award.**
- [86] C. Vonesch, T. Blu, and M. Unser. Generalized biorthogonal Daubechies wavelets. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet XI*, volume 5914, pages 59141X–1–59141X–6, San Diego, USA, July 31–August 3, 2005.
- [87] D. Van De Ville, T. Blu, B. Forster, and M. Unser. Semi-orthogonal wavelets that behave like fractional differentiators. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet XI*, volume 5914, pages 59140C–1–59140C–8, San Diego, USA, July 31–August 3, 2005.
- [88] F. Luisier, T. Blu, B. Forster, and M. Unser. Which wavelet bases are the best for image denoising? In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet XI*, volume 5914, pages 59140E–1–59140E–12, San Diego, USA, July 31–August 3, 2005.
- [89] I. Khalidov, T. Blu, and M. Unser. Generalized l-spline wavelet bases. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet XI*, volume 5914, pages 59140F–1–59140F–8, San Diego, USA, July 31–August 3, 2005.
- [90] D. Van De Ville, T. Blu, and M. Unser. WSPM: A new approach for wavelet-based statistical analysis of fMRI data. In *Eleventh Annual Meeting of the Organization for Human Brain Mapping (HBM'05)*, page S17, Toronto, Canada, June 12–16, 2005.
- [91] C. Vonesch, T. Blu, and M. Unser. Generalized daubechies wavelets. In *Proceedings of the Thirtieth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'05)*, volume IV, pages 593–596, Philadelphia, USA, March 18–23, 2005.

- [92] D. Van De Ville, T. Blu, B. Forster, and M. Unser. Isotropic-polyharmonic B-Splines and wavelets. In *Proceedings of the 2004 IEEE International Conference on Image Processing (ICIP'04)*, pages 661–664, Singapore, Singapore, October 24–27, 2004.
- [93] M. Jacob, T. Blu, and M. Unser. Shape estimation of 3-D DNA molecules from stereo cryo-electron micro-graphs. In *Proceedings of the 2004 IEEE International Conference on Image Processing (ICIP'04)*, pages 1883–1886, Singapore, Singapore, October 24–27, 2004.
- [94] R.V.V.L. Langoju, T. Blu, and M. Unser. Resolution enhancement in optical coherence tomography. In *2004 Annual Meeting of the Swiss Society of Biomedical Engineering (SSBE'04)*, Zürich, Switzerland, September 2–3, 2004. poster 9.
- [95] T. Blu, P. Thévenaz, and M. Unser. High-quality causal interpolation for online unidimensional signal processing. In *Proceedings of the Twelfth European Signal Processing Conference (EUSIPCO'04)*, pages 1417–1420, Wien, Austria, September 6–10, 2004.
- [96] D. Van De Ville, T. Blu, and M. Unser. WSPM: Wavelet processing and the analysis of fMRI using statistical parametric maps. In *Second International Conference on Computational Harmonic Analysis, Nineteenth Annual Shanks Lecture (CHA'04)*, Nashville, USA, May 24–30, 2004. Invited talk.
- [97] M. Unser and T. Blu. A unifying spline formulation for stochastic signal processing [Or how Schoenberg meets Wiener, with the help of Tikhonov]. In *Second International Conference on Computational Harmonic Analysis, Nineteenth Annual Shanks Lecture (CHA'04)*, Nashville, USA, May 24–30, 2004. Plenary talk.
- [98] B. Forster, T. Blu, and M. Unser. Complex B-Splines and wavelets. In *Second International Conference on Computational Harmonic Analysis, Nineteenth Annual Shanks Lecture (CHA'04)*, Nashville, USA, May 24–30, 2004.
- [99] T. Blu and M. Unser. Quantitative L^2 approximation error of a probability density estimate given by it samples. In *Proceedings of the Twenty-Ninth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'04)*, volume III, pages 952–955, Montréal, Canada, May 17–21, 2004.
- [100] D. Van De Ville, T. Blu, and M. Unser. Wavelet-based fMRI statistical analysis and spatial interpretation: A unifying approach. In *Proceedings of the Second IEEE International Symposium on Biomedical Imaging (ISBI'04)*, pages 1167–1170, Arlington, USA, April 15–18, 2004.
- [101] F. Precioso, M. Barlaud, T. Blu, and M. Unser. Smoothing B-Spline active contour for fast and robust image and video segmentation. In *Proceedings of the 2003 IEEE International Conference on Image Processing (ICIP'03)*, volume I, pages 137–140, Barcelona, Spain, September 14–17, 2003.
- [102] D. Van De Ville, T. Blu, and M. Unser. Wavelets versus resels in the context of fMRI: Establishing the link with SPM. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing X*, volume 5207, pages 417–425, San Diego, USA, August 3–8, 2003. Part I.
- [103] M. Unser and T. Blu. Fractional wavelets, derivatives, and Besov spaces. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing X*, volume 5207, pages 147–152, San Diego, USA, August 3–8, 2003. Part I.
- [104] M. Liebling, T. Blu, and M. Unser. Non-linear Fresnelet approximation for interference term suppression in digital holography. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing X*, volume 5207, pages 553–559, San Diego, USA, August 3–8, 2003. Part II.
- [105] K. Ichige, T. Blu, and M. Unser. Multiwavelet-like bases for high quality image interpolation. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing X*, volume 5207, pages 153–161, San Diego, USA, August 3–8, 2003. Part I.
- [106] B. Forster, T. Blu, and M. Unser. A new family of complex rotation-covariant multiresolution bases in 2D. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing X*, volume 5207, pages 475–479, San Diego, USA, August 3–8, 2003. Part I.

- [107] T. Blu and M. Unser. Harmonic spline series representation of scaling functions. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing X*, volume 5207, pages 120–124, San Diego, USA, August 3–8, 2003. Part I.
- [108] M. Unser and T. Blu. The spline foundation of wavelet theory. In *International Conference on Wavelets and Splines (EIMI-WS'03)*, pages 98–99, Saint Petersburg, Russia, July 3–8, 2003. Petersburg Department of Steklov Institute of Mathematics, Euler International Mathematical Institute.
- [109] M. Liebling, T. Blu, É. Cuche, P. Marquet, C.D. Depeursinge, and M. Unser. Local amplitude and phase retrieval method for digital holography applied to microscopy. In A.-M. Boccara, editor, *Proceedings of the SPIE European Conference on Biomedical Optics: Novel Optical Instrumentation for Biomedical Applications (ECBO'03)*, volume 5143, pages 210–214, München, Germany, June 22–25, 2003.
- [110] C. Depeursinge, É. Cuche, T. Colomb, P. Massatch, A. Marian, F. Montfort, M. Liebling, T. Blu, M. Unser, P. Marquet, and P.J. Magistretti. Digital holography applied to microscopy: A new imaging modality in the sub-wavelength range. In *Hundertvierte Jahrestagung der Deutschen Gesellschaft für angewandte Optik (DGaO)*, Münster (Westfalen), Germany, June 10–14, 2003.
- [111] D. Van De Ville, T. Blu, and M. Unser. On the approximation power of splines: Orthogonal versus hexagonal lattices. In *Proceedings of the Fifth International Workshop on Sampling Theory and Applications (SampTA'03)*, pages 109–111, Strobl, Austria, May 26–30, 2003.
- [112] R. van Spaendonck, T. Blu, R. Baraniuk, and M. Vetterli. Orthogonal Hilbert transform filter banks and wavelets. In *Proceedings of the Twenty-Eighth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'03)*, volume VI, pages 505–508, Hong Kong, China, April 6–10, 2003.
- [113] D. Van De Ville, T. Blu, and M. Unser. Recursive filtering for splines on hexagonal lattices. In *Proceedings of the Twenty-Eighth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'03)*, volume III, pages 301–304, Hong Kong, China, April 6–10, 2003.
- [114] K. Ichige, T. Blu, and M. Unser. Interpolation of signals by generalized piecewise-linear multiple generators. In *Proceedings of the Twenty-Eighth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'03)*, volume VI, pages 261–264, Hong Kong, China, April 6–10, 2003.
- [115] T. Blu and M. Unser. A complete family of scaling functions: The (α, τ) -fractional splines. In *Proceedings of the Twenty-Eighth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'03)*, volume VI, pages 421–424, Hong Kong, China, April 6–10, 2003.
- [116] T. Blu, P. Thévenaz, and M. Unser. How a simple shift can significantly improve the performance of linear interpolation. In *Proceedings of the 2002 IEEE International Conference on Image Processing (ICIP'02)*, volume III, pages 377–380, Rochester, USA, September 22–25, 2002.
- [117] M. Liebling, T. Blu, É. Cuche, P. Marquet, C. Depeursinge, and M. Unser. A novel non-diffractive reconstruction method for digital holographic microscopy. In *Proceedings of the First IEEE International Symposium on Biomedical Imaging (ISBI'02)*, volume II, pages 625–628, Washington, USA, July 7–10, 2002.
- [118] M. Jacob, T. Blu, and M. Unser. 3-D reconstruction of DNA filaments from stereo cryo-electron micrographs. In *Proceedings of the First IEEE International Symposium on Biomedical Imaging (ISBI'02)*, volume II, pages 597–600, Washington, USA, July 7–10, 2002.
- [119] T. Blu, H. Bay, and M. Unser. A new high-resolution processing method for the deconvolution of optical coherence tomography signals. In *Proceedings of the First IEEE International Symposium on Biomedical Imaging (ISBI'02)*, volume III, pages 777–780, Washington, USA, July 7–10, 2002.
- [120] T. Blu, M. Unser, and P. Thévenaz. Optimizing basis functions for best approximation. In *Fifth International Conference on Curves and Surfaces (ICCS'02)*, Saint Malo, France, June 27–July 3, 2002.
- [121] M. Unser and T. Blu. Fractional wavelets: Properties and applications. In *Proceedings of the First 2002 SIAM Conference on Imaging Science (SIAG-IS'02)*, volume MS1, page 33, Boston, USA, March 4–6, 2002.

- [122] M. Unser and T. Blu. Why restrict ourselves to compactly supported basis functions? In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing IX*, volume 4478, pages 311–314, San Diego, USA, July 29–August 1, 2001.
- [123] M. Liebling, T. Blu, and M. Unser. Fresnelets—A new wavelet basis for digital holography. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing IX*, volume 4478, pages 347–352, San Diego, USA, July 29–August 1, 2001.
- [124] M. Vetterli, P. Marziliano, and T. Blu. A sampling theorem for periodic piecewise polynomial signals. In *Proceedings of the Twenty-Sixth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'01)*, volume 6, pages 3893–3896, Salt Lake City, USA, May 7–11, 2001.
- [125] M. Vetterli, P. Marziliano, and T. Blu. Sampling discrete-time piecewise bandlimited signals. In *Proceedings of the Fourth International Conference on Sampling Theory and Applications (SampTA'01)*, pages 97–102, Orlando, USA, May 13–17, 2001.
- [126] J. Kybic, T. Blu, and M. Unser. Generalized sampling: A variational approach. In *Proceedings of the Fourth International Conference on Sampling Theory and Applications (SampTA'01)*, pages 151–154, Orlando, USA, May 13–17, 2001.
- [127] M. Jacob, T. Blu, and M. Unser. An error analysis for the sampling of periodic signals. In *Proceedings of the Fourth International Conference on Sampling Theory and Applications (SampTA'01)*, pages 45–48, Orlando, USA, May 13–17, 2001.
- [128] M. Unser and T. Blu. Fractional splines and wavelets: From theory to applications. In *Joint IDR-IMA Workshop: Ideal Data Representation*, Minneapolis, USA, April 9–13, 2001.
- [129] J. Kybic, T. Blu, and M. Unser. Variational approach to tomographic reconstruction. In M. Sonka and K.M. Hanson, editors, *Progress in Biomedical Optics and Imaging, vol. 2, no. 27*, volume 4322 of *Proceedings of the SPIE International Symposium on Medical Imaging: Image Processing (MI'01)*, pages 30–39, San Diego, USA, February 19–22, 2001. Part I.
- [130] M. Jacob, T. Blu, and M. Unser. A unifying approach and interface for spline-based snakes. In M. Sonka and K.M. Hanson, editors, *Progress in Biomedical Optics and Imaging, vol. 2, no. 27*, volume 4322 of *Proceedings of the SPIE International Symposium on Medical Imaging: Image Processing (MI'01)*, pages 340–347, San Diego, USA, February 19–22, 2001. Part I.
- [131] T. Blu, M. Sühling, P. Thévenaz, and M. Unser. Approximation order: Why the asymptotic constant matters. In *Second Pacific Rim Conference on Mathematics (PRCM'01)*, pages II.3–II.4, Taipei, Taiwan, January 4–8, 2001.
- [132] M. Unser, S. Horbelt, and T. Blu. Fractional derivatives, splines and tomography. In *Proceedings of the Tenth European Signal Processing Conference (EUSIPCO'00)*, volume IV, pages 2017–2020, Tampere, Finland, September 4–8, 2000.
- [133] P. Thévenaz, T. Blu, and M. Unser. Complete parametrization of piecewise-polynomial interpolators according to degree, support, regularity, and order. In *Proceedings of the 2000 IEEE International Conference on Image Processing (ICIP'00)*, volume II, pages 335–338, Vancouver, Canada, September 10–13, 2000.
- [134] A. Muñoz Barrutia, T. Blu, and M. Unser. Non-uniform to uniform grid conversion using least-squares splines. In *Proceedings of the Tenth European Signal Processing Conference (EUSIPCO'00)*, volume IV, pages 1997–2000, Tampere, Finland, September 4–8, 2000.
- [135] M. Jacob, T. Blu, and M. Unser. Exact computation of area moments for spline and wavelet curves. In *Proceedings of the Fifteenth International Conference on Pattern Recognition (ICPR'00)*, volume III, pages 131–134, Barcelona, Spain, September 3–8, 2000.
- [136] M. Feilner, T. Blu, and M. Unser. Analysis of fMRI data using spline wavelets. In *Proceedings of the Tenth European Signal Processing Conference (EUSIPCO'00)*, volume IV, pages 2013–2016, Tampere, Finland, September 4–8, 2000.
- [137] M. Unser and T. Blu. Wavelets and radial basis functions: A unifying perspective. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing VIII*, volume 4119, pages 487–493, San Diego, USA, July 31–August 4, 2000.

- [138] A. Muñoz Barrutia, T. Blu, and M. Unser. Non-Euclidean pyramids. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing VIII*, volume 4119, pages 710–720, San Diego, USA, July 31–August 4, 2000.
- [139] M. Feilner, T. Blu, and M. Unser. Optimizing wavelets for the analysis of fMRI data. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing VIII*, volume 4119, pages 626–637, San Diego, USA, July 31–August 4, 2000.
- [140] S. Horbelt, A. Muñoz Barrutia, T. Blu, and M. Unser. Spline kernels for continuous-space image processing. In *Proceedings of the Twenty-Fifth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'00)*, volume IV, pages 2191–2194, Istanbul, Turkey, June 5–9, 2000.
- [141] T. Blu and M. Unser. The fractional spline wavelet transform: Definition and implementation. In *Proceedings of the Twenty-Fifth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'00)*, volume I, pages 512–515, Istanbul, Turkey, June 5–9, 2000.
- [142] A. Muñoz Barrutia, T. Blu, and M. Unser. Efficient image resizing using finite differences. In *Proceedings of the 1999 IEEE International Conference on Image Processing (ICIP'99)*, volume III, pages 662–666, Kobe, Japan, October 25–28, 1999.
- [143] T. Blu, P. Thévenaz, and M. Unser. Generalized interpolation: Higher quality at no additional cost. In *Proceedings of the 1999 IEEE International Conference on Image Processing (ICIP'99)*, volume III, pages 667–671, Kobe, Japan, October 25–28, 1999.
- [144] M. Unser and T. Blu. Construction of fractional spline wavelet bases. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing VII*, volume 3813, pages 422–431, Denver, USA, July 19–23, 1999.
- [145] M. Feilner, T. Blu, and M. Unser. Statistical analysis of fMRI data using orthogonal filterbanks. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing VII*, volume 3813, pages 551–560, Denver, USA, July 19–23, 1999.
- [146] T. Blu and M. Unser. A theoretical analysis of the projection error onto discrete wavelet subspaces. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing VII*, volume 3813, pages 273–281, Denver, USA, July 19–23, 1999.
- [147] T. Blu, P. Thévenaz, and M. Unser. Minimum support interpolators with optimum approximation properties. In *Proceedings of the 1998 IEEE International Conference on Image Processing (ICIP'98)*, volume III, pages 242–245, Chicago, USA, October 4–7, 1998.
- [148] M. Unser and T. Blu. Spline wavelets with fractional order of approximation. In *Wavelet Applications Workshop*, Monte Verità, Switzerland, September 28–October 2, 1998.
- [149] S. Matusiak, M. Daoudi, T. Blu, and O. Avaro. Sketch-based images database retrieval. In *Proceedings of the Fourth International Workshop on Advances in Multimedia Information Systems (MIS'98)*, pages 185–191, Istanbul, Turkey, September 24–26, 1998.
- [150] T. Blu and M. Unser. A quantitative Fourier analysis of the linear approximation error by wavelets. In *Wavelet Applications Workshop*, Monte Verità, Switzerland, September 28–October 2, 1998.
- [151] M. Unser and T. Blu. Comparison of wavelets from the point of view of their approximation error. In *Proceedings of the SPIE Conference on Mathematical Imaging: Wavelet Applications in Signal and Image Processing VI*, volume 3458, pages 14–21, San Diego, USA, July 19–24, 1998.
- [152] L. Peyronny, O. Soligon, C. Roux, O. Avaro, and T. Blu. How to construct an MPEG4 API: A videoconference application example. In *Proceedings of the International Conference on Image and Multidimensional Digital Signal Processing (IMDSP'98)*, pages 111–114, Alpbach, Austria, July 16, 1998.
- [153] T. Blu and M. Unser. Quantitative L^2 error analysis for interpolation methods and wavelet expansions. In *Proceedings of the 1997 IEEE International Conference on Image Processing (ICIP'97)*, volume I, pages 663–666, Santa Barbara, USA, October 26–29, 1997.
- [154] T. Blu. Shift error in iterated rational filter banks. In *Proceedings of the Eighth European Signal Processing Conference (EUSIPCO'96)*, volume II, pages 1199–1202, Trieste, Italy, September 10–13, 1996.

- [155] T. Blu. An iterated rational filter bank for audio coding. In *Proceedings of the Third IEEE Signal Processing Society International Symposium on Time-Frequency and Time-Scale Analysis (IEEE-SP'96)*, pages 81–84, Paris, France, June 18–21, 1996.
- [156] T. Blu and O. Rioul. Wavelet regularity of iterated filter banks with rational sampling changes. In *Proceedings of the Eighteenth IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'93)*, volume III, pages 213–216, Minneapolis, USA, April 27–30, 1993.
- [157] T. Blu. Iterated rational filter banks—Underlying limit functions. In *Proceedings of the IEEE Signal Processing Society Digital Signal Processing Workshop*, pages 1.8.1–1.8.2, Utica, USA, September 13–16, 1992.
- [158] S. Mayrargue and T. Blu. Relationship between high-resolution methods and discrete Fourier transform. In *Proceedings of the Sixteenth IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP'91)*, volume V, pages 3321–3324, Toronto, Canada, May 14–17, 1991.