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1 Personal Data

Name : Massimo
Family name : Fornasier
Birthday : July 6 1975
Place of birth : Feltre (BL), Italy
Marital status : single, no kids
Academic titles : Prof. Dr. (It: Dott. Ric. Dott.)
Citizenship : Italian



Current Office : Full Professor (W3- Leuchtturm-Professur), Chair in Applied Numerical Analysis
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2 Presentation

My research embraces problems in nonlinear analysis and numerical analysis. I have been particularly interested in the concepts of thin structures, sparsity, and compression as appearing in different forms in variational models for data analysis, image and signal processing, mechanics, optimal control, and in the adaptive numerical solutions of partial differential equations or high-dimensional optimization problems. My recent work focuses on the (sparse and mean-field) controllability of various forms of evolutions (gradient flow, quasi-static, and dynamical game evolutions), and applications in multiagent systems as well as in machine learning.

I received my doctoral degree in Computational Mathematics in 2003 from the University of Padua, Italy. After spending from 2003 to 2006 as a postdoctoral research fellow at the University of Vienna and University of Rome “La Sapienza”, I joined the Johann Radon Institute for Computational and Applied Mathematics (RICAM) of the Austrian Academy of Sciences where I served as a Senior Research Scientist until March 2011. I was an Associate Researcher from 2006 to 2007 for the Program in Applied and Computational Mathematics of Princeton University, USA. In 2011 I got appointed Chair of Applied Numerical Analysis at TUM.

I’m author of ca 66 research papers. I have supervised the study and the research of 10 doctoral students and 16 postdocs. I was member of VQR, a panel responsible for the evaluation of the quality of research in Italy. I’m also a member of the Editorial Boards of Journal of Fourier Analysis and Applications, Networks and Heterogeneous Media, Calcolo, Journal of Scientific Computing, Mathematics of Computation and Data Science.

3 Curriculum Vitae

3.1 Education and academic degrees

Habilitation (venia docendi)

Habilitationsschrift title: *Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems*

Faculty of Mathematics,

University of Vienna, Austria

June 4, 2008

Doctoral degree in Computational Mathematics

Dissertation Title: *Constructive Methods for Numerical Applications in Signal Processing and Homogenization Problems*

no grades are provided in Italy

University of Padua (Italy), February 17 2003

Advisors: Prof. Dr. Hans Georg Feichtinger, Prof. Dr. Maria Morandi Cecchi

Graduate Programme in Computational Mathematics

University of Padua, Italy

Nov. 1999 – Dec. 2002

Laurea in Mathematics

Graduated *Summa cum Laude*

University of Padua, Italy

October 28 1999

Studies in Mathematics

University of Padua, Italy

Nov. 1994 – Oct. 1999

3.2 Academic positions

Full Professor in Applied Numerical Analysis

Faculty of Mathematics

Technical University of Munich, Germany.

April 2011 –

Visiting Professor

Faculty of Mathematics

University of Vienna, Austria.

March – May 2010

Visiting Scholar

Department of Mathematics

Texas A&M University, U.S.A.,

October – December 2009

Leader of the FWF START-Project

“Sparse Approximation and Optimization in High-Dimensions”

Johann Radon Institute for Computational and Applied Mathematics
Austrian Academy of Sciences, Austria.
April 2009 – June 2015

Leader of the Group of Analysis of Partial Differential Equations

(jointly with Peter A. Markowich) Johann Radon Institute for Computational and Applied Mathematics
Austrian Academy of Sciences, Austria.
January 2009 – March 2011

Senior Research Scientist

(tenured position since April 2010)
Johann Radon Institute for Computational and Applied Mathematics
Austrian Academy of Sciences, Austria.
June 2006 – March 2011

Research Associate

Program in Applied and Computational Mathematics
Princeton University, U.S.A.
October 2006 – October 2007

Individual Marie Curie Fellow

Faculty of Mathematics
University of Vienna, Austria
May 2004 – April 2006

Research Assistant

Department of Mathematical Methods and Models for Applied Sciences
University of Rome “La Sapienza”, Italy
June 2003 – May 2006

Research Assistant (Marie Curie Fellow)

EU-network RTN HASSIP (Harmonic Analysis and Statistics for
Signal and Image Processing, contract HPRN-CT-2002-00285)
Faculty of Mathematics
University of Vienna, Austria
January 2004 – April 2004

Research Assistant (Marie Curie Fellow)

EU-network RTN HASSIP (Harmonic Analysis and Statistics for
Signal and Image Processing, contract HPRN-CT-2002-00285)
AG Numerik/Wavelet Analysis Group – Zentrum für TechnoMathematik
University of Marburg and University of Bremen, Germany
July 2003 – December 2003

Research Assistant (Marie Curie Fellow)

EU-network RTN HASSIP (Harmonic Analysis and Statistics for
Signal and Image Processing, contract HPRN-CT-2002-00285)
Faculty of Mathematics
University of Vienna, Austria
May 2003 – June 2003

Research Assistant (Österreich-Stipendium/Austrian Scholarship)

Faculty of Mathematics

University of Vienna, Austria
November 2002 – April 2003

Doctoral student Graduate Program in Computational Mathematics
University of Padua, Italy
November 1999 – October 2002

3.3 Other contracts and cooperations

Consulting contract (project: FWF Operatoren fuer Zeit-Frequenz Analysis)
Faculty of Mathematics
University of Vienna, Austria
November 2002 – April 2003

Cooperation pro bono publico (Mantegna Project)
Conception and realization of the Mantegna Project, the mathematical and computer assisted restoration of Mantegnas art frescoes in the Eremitani Church in Padua
Mantegna Project Lab.
University of Padua, Italy
1999 – 2010

3.4 Individual honors and awards

Review Board, Italian National Agency for the Evaluation of the University System and Research (ANVUR), 2015-2017

Invited Speaker at the 7th European Congress of Mathematics, Berlin, July 18-22, 2016.

Editor of Networks and Heterogenous Media, January 2014, Journal of Fourier Analysis and Applications, May 2014, Calcolo, November 2014, Journal Scientific Computing, January 2016, Mathematical Control and Related Fields, April 2017.

Member of the Institute of Advanced Studies of the Technical University of Munich, August 10, 2012.

ERC-Starting Grant for the project “High-Dimensional Sparse Optimal Control”, July 19, 2012.

Lezione Lagrangiana within the project: “Towards an efficient diffusion of innovative mathematical results”, University of Torino, Italy, May 22, 2012.

Binnial SIMAI Prize, Società Italiana di Matematica Applicata ed Industriale, Italy, 2012.

Leuchtturm Professur (Lighthouse Professorship), Technical University of Munich, Germany, 2011.

Heisenberg Professorship (Deutsche Forschungsgemeinschaft), a start-up co-financing for a Chair in Numerical Analysis at the Philipps-University of Marburg in Germany, 2010 (declined)

Best Paper Award (Jubiläumfonds der Stadt Wien für die ÖAW 2009), Austria, 2010, for the paper *Iteratively re-weighted least squares minimization for sparse recovery* (with I. Daubechies, R. DeVore, C. S. Güntürk), Commun. Pure Appl. Math., Vol. 63, no. 1, 2010, pp. 1-38

Scientific prize “Prix de Boelpaepe” of the Académie Royale de Belgique – Classe des Sciences, April 4 2009, Belgium

The paper *Restoration of color images by vector valued BV functions and variational calculus* (with R. March), SIAM J. Appl. Math., Vol. 68 No. 2, 2007, pp. 437-460 is used by SIAM (Society for Industrial and Applied Mathematics in the U.S.A.) as a relevant example of applicable mathematics:

<http://www.siam.org/publicawareness/images.php>

FWF-START award 2008 for the project “Sparse Approximation and Optimization in High-Dimensions”

Finalist (among the best 4 candidates) for the scientific prize “Young researchers in Mathematics competition”, University of Padua, 2007

Scientific Prize for “A scientific work on the computer restoration of the fragments of the art frescoes in the Eremitanis Church in Padua”, University of Padua, Italy, 1999

Marie Curie Outgoing International Fellowship (contract MOIF-CT-2006-039438, 18 months) of the European Commission (6th Framework Programme) project “Sparse Approximation for Blind Source Separation”, 2006

Individual Marie Curie Fellowship (contract MEIF-CT-2004-501018, 2 years) of the European Commission (6th Framework Programme) project “Flexible Time-Frequency Decompositions and Adaptive Treatment of Operator Equations by Frames”, 2004

Research fellowship (assegno di ricerca, 3 years) “Wavelets and frames in approximation theory”, University of Rome “La Sapienza”, Italy, 2003

Austrian scholarship (Österreich-Stipendium, 6 months) of the Federal Ministry for Education, Science, and Culture (BMBWK) via ÖAD (Österreichischer Austauschdienst) and the Ministero degli Esteri Italiano (the Italian Ministry of Foreign Affairs), Austria, 2002

Doctoral Studies Scholarship (3 years) of the University of Padua, Italy, 1999

3.5 Research publications

3.5.1 Submitted preprints to refereed journals

1. *Robust and resource efficient identification of two hidden layer neural networks* (with T. Klock and M. Rauchensteiner), preprint, June 2019
2. *Robust and resource efficient identification of shallow neural networks by fewest samples* (with I. Daubechies and J. Vybíral), preprint, April 2019
3. *Spatially inhomogeneous evolutionary games* (with L. Ambrosio, M. Morandotti, and G. Savaré), preprint, April 2018
4. *Sparse PCA from inaccurate and incomplete measurements*, (with J. Maly and V. Naumova), preprint, January 2018.
5. *A machine learning approach to optimal Tikhonov regularisation I: affine manifolds* (with E. De Vito and V. Naumova), October 2016.
6. *Numerical analysis on Cucker-Smale collective behavior models* (with F. Vecil), 2013, pp. 43

3.5.2 Refereed journal papers

7. *Mean-field optimal control as Γ -limit of finite agent controls*, (with S. Lisini, C. Orrieri and G. Savaré), to appear in European Journal of Applied Mathematics
8. *A relaxed Kacarov iteration for the p -Poisson problem*, (with L. Diening, R. Tomasi, and M. Wank), to appear in Numerische Mathematik

9. *A Boltzmann approach to mean-field sparse feedback control*, (with G. Albi and D. Kalise), IFAC-PapersOnLine, Volume 50, Issue 1, July 2017, Pages 2898-2903
10. *Mean-field Pontryagin maximum principle* (with M. Bongini, F. Rossi and F. Solombrino), Journal of Optimization Theory and Applications, October 2017, Volume 175, Issue 1, pp 138
11. *Mean field control hierarchy* (with G. Albi, Y.-P. Choi, and D. Kalise), Applied Mathematics and Optimization, August 2017, Volume 76, Issue 1, pp 93135
12. *Inferring Interaction Rules from Observations of Evolutive Systems I: The Variational Approach*, (with M. Bongini, M. Hansen and M. Maggioni.) Math. Models Methods Appl. Sci., Volume 27, Issue 05, May 2017
13. *Linearly constrained evolutions of critical points and an application to cohesive fractures*, (with M. Artina, F. Cagnetti, and F. Solombrino) Math. Models Methods Appl. Sci., 27(02):231-290, 2017.
14. *Conjugate gradient acceleration of iteratively re-weighted least squares methods*, (with S. Peter, H. Rauhut and S. Worm) Computational Optimization and Applications, 65(1):205-259, 2016.
15. *Biological transportation networks: modeling and simulation*, (G. Albi, M. Artina, and P.A. Markowich) Anal. Appl. (Singap.), 14(1):185-206, 2016.
16. *Consistency of probability measure quantization by means of power repulsion-attraction potentials* (with J.-C. Hütter), J. Fourier Anal. Appl., 22(3):694-749, 2016.
17. *Sparse stabilization and control of alignment models* (M. Caponigro, M. Fornasier, B. Piccoli and E. Trelat), Math. Models Methods Appl. Sci., Vol. 25, No. 3, 2015, pp. 521-564
18. *Anisotropic mesh adaptation for crack detection in brittle materials* (with M. Artina, S. Micheletti and S. Perotto), SIAM J. Sci. Comput., 37(4):B633-B659, 2015.
19. *Multilevel preconditioning for sparse optimization of functionals with nonconvex fidelity terms* (with S. Dahlke, U. Friedrich and T. Raasch), J. Inverse Ill-Posed Probl., 23(4):393-414, 2015.
20. *(Un)conditional consensus emergence under perturbed and decentralized feedback controls*, (with S. Dahlke, U. Friedrich and T. Raasch) Discrete Contin. Dyn. Syst., 35(9):4071-4094, 2015.
21. *Sparse control of alignment models in high dimension*, (with M. Bongini, O. Junge and B. Scharf), Netw. Heterog. Media, 10(3):647-697, 2015.
22. *Damping noise-folding and enhanced support recovery in compressed sensing* (with M. Artina, and S. Peter), IEEE Trans. Signal Proc., Vol 63, No. 22, pp. 5990-6002, November 2015
23. *Parameter choice strategies for multi-penalty regularization* (with V. Naumova, and S. V. Pereverzyev), SIAM J. Numer. Anal., Vol. 52, No. 4, 2014, pp. 1770-1794
24. *Quasi-linear compressed sensing* (with M. Ehler and J. Sigl), Multiscale Modeling and Simulation, Vol. 12, No. 2, pp. 725-754, 2014
25. *Sparse stabilization of dynamical systems driven by attraction and avoidance forces* (with M. Bongini), Netw. Heterog. Media, 9(1):1-31, 2014.
26. *Mean-field sparse optimal control* (with B. Piccoli and F. Rossi), Philos. Trans. R. Soc. Lond. Ser. A Math. Phys. Eng. Sci., 372(2028):20130400, 21, 2014.
27. *Asymptotic behavior of gradient flows driven by nonlocal power repulsion and attraction potentials in one dimension* (with M. Di Francesco, J.-C. Hütter and D. Matthes.) SIAM J. Math. Anal., 46(6):3814-3837, 2014.
28. *Mean-field optimal control* (with F. Solombrino), ESAIM: Control, Optimization, and Calculus of Variations, Vol. 20, No. 4, 2014, pp. 1123-1152
29. *Sparse stabilization and optimal control of the Cucker-Smale model* (with M. Caponigro, B. Piccoli, and E. Trelat), Mathematical Control And Related Fields, Vol. 3, No. 4, December 2013, pp. 447-466
30. *Linearly constrained nonsmooth and nonconvex minimization* (with M. Artina and F. Solombrino), SIAM J. Opt., Vol. 23, No. 3, 2013, pp. 1904-1937
31. *Consistency of variational continuous-domain quantization via kinetic theory* (with J. Haskovec and G. Steidl), Applicable Analysis, Vol. 92, No. 6, 2013, pp. 1283-1298
32. *Existence of minimizers of the Mumford and Shah functional with singular operators and unbounded data* (with R. March and F. Solombrino), Ann. Mat. Pura Appl., Vol. 192, No. 3, 2013, pp. 361-391
33. *Wavelet decomposition method for L2/TV-image deblurring* (with Y. Kim, A. Langer, and C.-B. Schoenlieb), SIAM J. Imag. Sci., 5, No. 3, 2012, pp. 857-885.

34. *Learning functions of few arbitrary linear parameters in high dimensions* (with K. Schnass and J. Vybiral), Found. Comput. Math., Vol. 2, No. 2, 2012, pp. 229-262
35. *Particle systems and kinetic equations modeling interacting agents in high dimension* (with J. Haskovec and J. Vybiral), Multiscale Modeling and Simulation, Vol. 81, No. 277, 2012, pp. 419-446
36. *Multilevel preconditioning and adaptive sparse solution of inverse problems* (with S. Dahlke and T. Raasch), Math. Comput., Vol. 81, No. 277, 2012, pp. 419-446
37. *Low rank matrix recovery via iteratively reweighted least squares minimization* (with H. Rauhut and R. Ward), SIAM J. Optim., Vol. 21, No. 4, 2011, pp. 1614-1640
38. *Fluid dynamic description of flocking via Povzner-Boltzmann equation* (with J. Haskovec and G. Toscani), Physica D (nonlinear phenomena), Vol. 240, no. 1, 2011, pp. 21-31
39. *A convergent overlapping domain decomposition method for total variation minimization* (with A. Langer and C.-B. Schönlieb), Numer. Math., Vol. 116, no. 4, 2010, pp. 645-685
40. *A kinetic flocking model with diffusion* (with R. Duan and G. Toscani), Commun. Math. Phys., Vol. 300, no. 1, 2010, pp. 95-145
41. *Asymptotic flocking dynamics for the kinetic Cucker-Smale model* (with J. A. Carrillo, J. Rosado, and G. Toscani), SIAM J. Math. Anal., Vol. 42, no. 1, 2010, pp. 218-236
42. *Iterative thresholding meets free-discontinuity problems* (with R. Ward), Found. Comput. Math., Vol. 10, no. 5, 2010, pp. 527-567
43. *Optimal adaptive computation in the Jaffard algebra and localized frames* (with S. Dahlke and K. Gröchenig), J. Approx. Theory, Vol. 162, no. 1, 2010, pp. 153-185.
44. *Iteratively re-weighted least squares minimization for sparse recovery* (with I. Daubechies, R. DeVore, C. S. Güntürk), Commun. Pure Appl. Math., Vol. 63, no. 1, 2010, pp. 1-38
45. *Subspace correction methods for total variation and ℓ_1 -minimization*, (with C.-B. Schönlieb), SIAM J. Numer. Anal., Vol. 47, no. 5, 2009, pp. 3397-3428
46. *The application of joint sparsity and total variation minimization algorithms to a real-life art restoration problem* (with R. Ramlau and G. Teschke), Adv. Comput. Math., Vol. 31, Nos 1-3, 2009, pp. 301-329.
47. *Nonlinear and adaptive frame approximation schemes for elliptic PDEs: theory and numerical experiments* (with S. Dahlke, M. Primbs, T. Raasch, M. Werner), Numerical Methods for Partial Differential Equations, Vol. 25, no. 6, 2009, pp. 1366-1401
48. *Iterative thresholding algorithms* (with H. Rauhut), Appl. Comput. Harmon. Anal., Vol. 25, No. 2, 2008, pp. 187-208.
49. *Adaptive frame methods for nonlinear variational problems* (with M. Charina and C. Conti), Numer. Math., Vol. 109 No. 1, 2008, pp. 45-75.
50. *Accelerated projected gradient method for linear inverse problems with sparsity constraints* (with I. Daubechies and I. Loris), J. Fourier Anal. Appl., Vol. 14, No. 5-6, 2008, pp. 764-792.
51. *Recovery algorithms for vector valued data with joint sparsity constraints* (with H. Rauhut), SIAM J. Numer. Anal., vol. 46, No. 2, 2008, pp. 577-613.
52. *Adaptive iterative thresholding algorithms for magnetoencephalography (MEG)* (with F. Pitolli), J. Comput. Appl. Math., Vol. 221 No. 2, 2008, pp. 386-395
53. *Sampling theorems on bounded domains* (with L. Gori), J. Comput. Appl. Math., Vol. 221 No. 2, 2008, pp. 376-385
54. *Generalized coorbit theory, Banach frames, and the relation to α -modulation spaces* (with S. Dahlke, H. Rauhut, G. Steidl, and G. Teschke), Proc. London Math. Soc., Vol. 6 No. 2, 2008, pp. 464-506.
55. *Adaptive frame methods for elliptic operator equations: the steepest descent approach* (with S. Dahlke, T. Raasch, R. Stevenson and M. Werner), IMA J. Numer. Anal., Vol. 27 No. 4, 2007, pp. 717-740
56. *Banach frames for α -modulation spaces*, Appl. Comp. Harmon. Anal., Vol. 22, No. 2, 2007, pp. 157-175.
57. *Adaptive frame methods for elliptic operator equations*, (with S. Dahlke and T. Raasch) Adv. Comp. Math., Vol. 27 No. 1, 2007, pp. 2763
58. *On some stability results of localized atomic decompositions*, Rend. Mat. Appl., No. 26, 2006, pp. 315-325.

59. *Nonlinear projection recovery in digital inpainting for color image restoration*, J. Math. Imaging Vis. Vol. 24, No. 3, 2006, pp. 359-373.
60. *Flexible Gabor-wavelet atomic decompositions for L^2 Sobolev spaces* (with H. G. Feichtinger), Ann. Mat. Pura Appl. Vol. 185(4), No. 1, 2006, pp. 105-131.
61. *Continuous frames, function spaces, and the discretization problem* (with H. Rauhut), J. Fourier Anal. Appl., Vol. 11, No. 3, 2005, pp. 245-287.
62. *Intrinsic localization of frames* (with K. Gröchenig), Constr. Approx., Vol. 22, No. 3, 2005, pp. 395-415.
63. *Fast homogenization algorithm based on asymptotic theory and multiscale schemes* (with M. Morandi Cecchi), Numer. Algorithms, Vol. 40, No. 2, 2005, pp. 171-186
64. *Fast, robust, and efficient 2D pattern recognition for re-assembling fragmented images* (with D. Toniolo), Pattern Recognition, Vol. 38, No. 11, 2005, pp. 2074-2087.
65. *Quasi-orthogonal decompositions of structured frames*, J. Math. Anal. Appl. Vol. 289, No. 1, 2004, pp. 180-199.
66. *Function spaces inclusions and rate of convergence of Riemann-type sums in numerical integration*, Numer. Funct. Anal. Opt., Vol. 24, Nos. 1 & 2, 2003, pp. 45-57.

3.5.3 Conference papers

67. *Learning and sparse control of multiagent systems*, In Proc. 7thECM, pp. 31, 2016.
68. *Anisotropic adaptive meshes for brittle fractures: parameter sensitivity* (with M. Artina, S. Micheletti, and S. Perotto), ENUMATH conference proceeding, November 2013, pp. 8
69. *Sparse control of force field dynamics* (with M. Bongini, F. Frhlich, and L. Haghverdi), Proceedings of the International Conference on NETWORK Games CONTROL and oPTimization 2014, ISBN: 978-88-8443-574-3, November 2014, pp. 6
70. *Mathematical methods for spectral image reconstruction* (with W. Baatz and J. Haskovec), Proceedings of the workshop Scientific Computing for Cultural Heritage, Heidelberg Germany, November 2009.
71. *Binary based fresco restoration* (with W. Baatz, P. Markowich, and C.-B. Schönlieb), Proceedings of the conference Bridge 2009: Mathematics, Music, Art, Architecture, Culture, pp. 337-338
72. *Compressive Algorithms. Adaptive Solutions of PDE's and Variational Problems*, invited lecture for the IMA Mathematics of Surfaces XIII conference, 2009
73. *Electric current density imaging via an accelerated iterative algorithm with joint sparsity constraints* (with G. Bretti and F. Pitolli), SPARS'09 - Signal Processing with Adaptive Sparse Structured Representations (2009)
74. *Domain decomposition methods for compressed sensing* (with A. Langer and C.-B. Schönlieb), Proc. Int. Conf. SampTA09, Marseilles, 2009
75. *Mathematics enters the picture*, Proceedings of the workshop MathKnow 2008, Springer, 2009
76. *Iteratively re-weighted least squares minimization: proof of faster than linear rate for sparse recovery* (with I. Daubechies, R. DeVore, and C. S. Güntürk), Information Sciences and Systems, 2008. CISS 2008. 42nd Annual Conference, pp. 26-29
77. *Inpainting of ancient Austrian frescoes* (with W. Baatz, C.-B. Schönlieb, and P. Markowich), Conference proceedings of Bridges 2008, Leeuwarden 2008, pp.150-156.
78. *Faithful recovery of vector valued functions from incomplete data. Recolorization and art restoration*, Lecture Notes in Computer Science, Volume 4485/2007, Proceedings of the First International Conference on Scale Space Methods and Variational Methods in Computer Vision (Sgallari, Fiorella; Murli, Almerico; Paragios, Nikos Eds.), 2007, pp. 116-127.
79. *On elementary sampling theorems on bounded domains* (with L. Gori), Proc. Int. Conf. ICNAAM 2005 (Ed. Simos Theodore S. et al.), Weinheim: Wiley-VHC, pp. 619-623.
80. *Building a bridge between Gabor and wavelet worlds*, Mini-Workshop: Wavelets and Frames, Feb. 15-21 2004, Oberwolfach Reports, 1(1), 2004, pp. 490-494.
81. *Decompositions of Hilbert spaces: local construction of global frames*, Proc. Int. Conf. Constructive Function theory 2002, Varna, DARBA, Sofia, 2003, pp. 275-281.

3.5.4 Book chapters

82. *Sparse Control of Multiagent Systems*, (with M. Bongini), in *Active Particles, Volume 1: Advances in Theory, Models, and Applications*, N. Bellomo P. Degond and E. Tadmor (ed.), Birkhuser-Springer, 2017

83. *An Overview on Algorithms for Sparse Recovery* (with S. Peter), in *Sparse Reconstruction and Compressive Sensing in Remote Sensing*, ed. X. Zhu and R. Bamler, Springer, June 2015, pp 76

84. *Rotation Invariance in Exemplar-based Image Inpainting* (with M. Eller), *Radon Series on Computational and Applied Mathematics*, 2015.

85. *Particle, Kinetic, Hydrodynamic Models of Swarming* (with J. A. Carrillo, G. Toscani, and F. Vecil), within the book “Mathematical modeling of collective behavior in socio-economic and life-sciences”, Birkhäuser (in preparation, Eds. Lorenzo Pareschi, Giovanni Naldi, and Giuseppe Toscani), 2010, 34 pp.

86. *Numerical Methods for Sparse Recovery* within the book “Theoretical Foundations and Numerical Methods for Sparse Recovery”, *Radon Series in Applied and Computational Mathematics*, de Gruyter (Ed. Massimo Fornasier), 2010, 110 pp.

87. *Compressive Sensing* (with Holger Rauhut) in the “Handbook of Mathematical Methods in Imaging”, Springer 2010 (<http://refworks.springer.com/mrw/index.php?id=2420>)

88. *Il Progetto Mantegna: storia e risultati* (Italian) (with R. Cazzato, G. Costa, A. Dal Farra, D. Toniolo, D. Tosato, C. Zanuso), in *Andrea Mantegna. La Cappella Ovetari a Padova* (Anna Maria Spiazzi, Alberta De Nicolò Salmazo, Domenico Toniolo eds.), Skira, 2006.

89. *Computer-based re-composition of the frescoes in the Ovetari Chapel in the Church of the Eremitani in Padua. Methodology and initial results*, (Italian/English) (with D. Toniolo), in “Mantegna nella chiesa degli Eremitani a Padova. Il recupero possibile” Ed. Skira, May 2003, pp. 15-23.

3.5.5 Books

90. *Theoretical Foundations and Numerical Methods for Sparse Recovery*, *Radon Series in Applied and Computational Mathematics*, de Gruyter, July 2010

(<http://www.degruyter.de/cont/fb/ma/detail.cfm?isbn=9783110226140&sel=pi>)

3.5.6 Dissertations

91. *Compressive Algorithms. Adaptive Solutions of PDE's and Variational Problems*, Habilitationsschrift, Faculty of Mathematics, University of Vienna, January 7, 2008, 426 pp.

92. *Constructive Methods for Numerical Applications in Signal Processing and Homogenization Problems*, doctoral thesis, University of Padua, Dec. 2002.

93. *Un metodo per la rappresentazione e il confronto di immagini a meno di rotazioni. Un contributo alla ricostruzione virtuale degli affreschi della Chiesa degli Eremitani in Padova* (Italian), Laurea thesis, Department of Pure and Applied Mathematics, University of Padua, Oct. 1999.

3.5.7 Lecture notes

94. *Foundations of Data Analysis*, Lecture Notes, 2017, in development

95. *Introduzione all'analisi armonica numerica* (Italian), Lecture Notes, 2007 112 pp.

96. *Numerik gewöhnlicher Differentialgleichungen* (German), Lecture Notes, 2013 106 pp.

3.5.8 Miscellaneous

97. *Proposta per una anastilosi informatica degli affreschi della Capella Ovetari nella Chiesa degli Eremitani in Padova* (Italian) (with C. Fanin and D. Toniolo), technical report DFPD 02/EI/31, Department of Physics “G. Galilei”, University of Padua.

98. *Compactly supported circular harmonics: fast, robust and efficient 2D pattern recognition*, (with D. Toniolo), technical report DFPD 02/EI/32, Department of Physics “G. Galilei”, University of Padua.

99. *Una discussione matematica sulla rappresentazione ed il confronto di immagini a meno di rotazioni. Un contributo alla ricostruzione informatica degli affreschi nella Chiesa degli Eremitani in Padova* (Italian), technical report DFPD 99/EI/24, Department of Physics “G. Galilei”, University of Padua.

3.6 Oral presentations

3.6.1 Plenary lectures

1. Robust and efficient identification of neural networks, SampTA, University of Bordeaux, July 2019
2. Variational quantization of measures: an harmonic analysis approach, Aspects of Time Frequency Analysis, Politecnico di Torino, June 2019
3. Spatially homogeneous evolutionary games, XVIII Italian Meeting on Hyperbolic Equations - IperPA2019, May 2019
4. Sparse and mean-field optimal control, 14th Viennese Conference on Optimal Control and Dynamic Games, July 2018
5. Learning and sparse control of multiagent systems, Int. Symp. “Machine Learning Challenges in Complex Multiscale Physical Systems”, TUM-IAS, Jan. 2017
6. Learning and sparse control of multiagent systems, Int. Conf. “Approximation Methods and Data Analysis”, Sept. 2016
7. Mean-field sparse optimal control, Conference “Calcolo Scientifico e Modelli Matematici”, University of Genova, June, 2015
8. Learning sums of ridge-functions in high dimension, Int. Symp. “Big Data and Predictive Computational Modeling”, TUM-IAS, May 2015
9. Random dimensionality reduction and sparse recovery algorithms, Conference of the Italian Society in Applied and Industrial Mathematics, June 27, 2012
10. Inverse free-discontinuity problems and iterative thresholding algorithms, “Mathematics and Image Analysis 2012”, Institut Henri Poincaré, Paris, France, 16-18 January 2012
11. Compressive algorithms. Adaptive solutions of PDE’s and variational problems, Int. Conf. Surfaces XIII, University of York, UK, September 7-9, 2009.
12. Compressive algorithms. Multilevel preconditioning and convergence rates, Int. Conf. Modern Methods of Time-Frequency Analysis, Strobl, Austria, June 15-20, 2009.
13. Variational principles and compressive algorithms, Int. Conf. “Mathematical Methods for Curves and Surfaces”, Toensberg, Norway, June 26-July 1, 2008.
14. Mathematical imaging and visual art restoration, “SCCH 2007: Scientific Computing and the Cultural Heritage IWR Workshop”, Heidelberger Akademie der Wissenschaften, Heidelberg, Germany, November 12-14, 2007.

3.6.2 Colloquia

1. Sparse mean-field optimal control, Department of Mathematics, University of Stuttgart, Jan. 12., 2017
2. Mathematics enters the picture, Department of Mathematics, Politecnico di Torino, Feb. 19-21, 2017
3. Sparse mean-field optimal control, Department of Mathematics, University of Osnabrueck, Jan. 31 - Feb. 02, 2016
4. Sparse mean-field optimal control, Department of Computer Science, University of Bolzano, Nov. 11-13, 2015
5. Sparse mean-field optimal control, Courant Institute, New York University, Sept. 10-15, 2015
6. Sparse mean-field optimal control, Department of Mathematics, University of Maryland, Sept. 08-10, 2015
7. Sparse mean-field optimal control, Department of Mathematics, University of Mainz, April 30, 2015
8. Mathematics reconstructing art, Department of Mathematics, Katholische Universität Eichstätt, Jan. 21 2015

9. The virtual restoration of Mantegnas frescoes in Padua, Department of Mathematics, University of Würzburg, May 23 2014
10. Un Mantegna restaurato tra matematica e nuove tecnologie, Department of Mathematics, University of Padova, May 13 2014
11. Sparse mean field optimal control, Department of Mathematics, University of Oslo, March 20, 2014
12. Consistency of probability measure quantization by means of power repulsion-attraction potentials, Department of Mathematics, University of Pisa, 17-20 Feb 2014
13. Sparse stabilization and control of consensus models, Kolloquium, Department of Mathematics, University of Göttingen, Jan 23 2013
14. Random dimensionality reduction and sparse recovery algorithms, Kolloquium der Hurwitz-Gesellschaft, Antrittsvorlesung, Fakultät f. Mathematik, TUM, July 4, 2012
15. Mathematics enters the picture: Mantegna's frescoes in Padua and their computer assisted restoration, Department of Mathematics, University of Torino, May 23, 2012
16. Random dimensionality reduction and sparse recovery algorithms, Lezione Lagrangiana, Department of Mathematics, University of Torino, May 22, 2012 Numerische Analysis
17. Analysis and simulation of particle systems and kinetic equations modeling interacting agents in high dimension, Department of Mathematics, Technical University of Berlin, Apr. 18, 2012
18. Analysis and simulation of particle systems and kinetic equations modeling interacting agents in high dimension, Department of Mathematics, University of Vienna, Nov. 11 2011
19. Compression, adaptivity, multiscale, and decompositions in the numerical solutions of Partial Differential Equations, Department of Mathematics, University of Heidelberg, Jan. 27 2011
20. Compression, adaptivity, multiscale, and decompositions in the numerical solutions of Partial Differential Equations, Faculty of Mathematics, University of Vienna, Oct. 7, 2010
21. Mathematics Enters the Picture. (The restoration of the Mantegna's frescoes in Padua), Kunsthistorische Gesellschaft, Institut für Kunstgeschichte, University of Vienna, May 26, 2010.
22. Compressed numerical methods for well-posed and degenerate elliptic PDEs, Department of Mathematics, Technical University of Munich, May 20, 2010
23. Innovative Sparse Recovery Methods for PDEs, Mathematical Colloquium, Department of Mathematics, University of Osnabrück, May 12, 2010
24. Compressed numerical methods for well-posed and degenerate elliptic PDEs, Seminar for Applied Mathematics, ETH-Zürich, April 12, 2010
25. Compressed numerical methods for well-posed and degenerate elliptic PDEs, Department of Mathematics, University of Basel, November 19 2009
26. Compressed numerical methods for well-posed and degenerate elliptic PDEs, Institut für Numerische und Angewandte Mathematik, University of Göttingen, October 31 2009
27. Compressed numerical methods for well-posed and degenerate elliptic PDEs, Institute for Numerical Simulation, University of Bonn, October 29, 2009
28. Sparse approximation and optimization in high dimensions, Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany, June 23, 2009.
29. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, Department of Mathematics and Computer Sciences, Technical University of Munich, Germany, June 2 2009.
30. Sparse Approximation and Optimization in High Dimensions, Faculty of Mathematics, University of Vienna, Austria, May 13 2009.
31. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, Center of Mathematics for Applications, University of Oslo, Norway, Apr. 16. 2009.
32. Innovative theories, methods, and applications in signal and image processing, IDIAP-EPFL, Lausanne, Switzerland, March 18, 2009
33. Variational principles and compressive algorithms, Department of Mathematics, University of Regensburg, Germany, October 1, 2008.
34. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, Seminar for Applied Mathematics, ETH-Zurich, Dec. 17. 2008.

35. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, Department of Mathematics, University of Leeds, UK, June 19, 2008.

36. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, Department of Mathematics, University of Rostock, Germany, June 18, 2008.

37. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, Habilitationskolloquium, Faculty of Mathematics, University of Vienna, Austria, June 4 2008.

38. Faithful recovery of vector valued functions from incomplete data. Recolorization and art restoration, Colloquium, Institut für Numerische und Angewandte Mathematik (NAM), Georg-August-Universität Göttingen, Göttingen, Germany, Dec. 19 2006.

39. Faithful recovery of vector valued functions from incomplete data. Recolorization and art restoration, Colloquium, Program in Applied and Computational Mathematics, Princeton University, Princeton, U.S.A., Nov. 20 2006.

3.6.3 Invited seminars at universities and research institutions

1. Mathematics enters the picture, DAMTP, University of Cambridge, 26 May, 2017

2. Learning and sparse control of multiagent systems, DAMTP, University of Cambridge, 26 May, 2017

3. Learning and sparse control of multiagent systems, Dept. Math., ETH-Zurich, April 23-28, 2017

4. Learning sums of ridge functions in high dimension, Dept. Math., Duke University, Sept. 2015.

5. Linearly constrained evolutions of critical points and adaptive anisotropic remeshing in brittle fracture simulation, Department of Mathematics, Technical University of Berlin, May 5, 2015

6. Consistency of probability measure quantization by means of power repulsion-attraction potentials, Department of Mathematics, RWTH Aachen, June 16-17, 2014

7. Introduction to compressed sensing, Department of Mathematics, University of Oslo, March 21, 2014

8. The projection method for dynamical systems and kinetic equations modelling interacting agents in high-dimension, Dept. Math., Duke University, Sept. 2011.

9. The projection method for dynamical systems and kinetic equations modelling interacting agents in high-dimension, Depart. Math., University of Padua, Sept. 2011.

10. Particle systems and kinetic equations modeling interacting agents in high-dimension, Hausdorff Center for Mathematics, University of Bonn, June 2010

11. Mathematics enters the picture. An Italian touch on mathematical imaging, Center for Approximation Theory Seminar, Texas A&M University, U.S.A., Nov. 2009

12. Efficient numerical methods for L_1 -minimization, Numerical Analysis Seminar, Texas A&M University, U.S.A., Oct. 2009

13. Special seminar: A Closer Look to Compressed Sensing, Sparse Recovery, and Generalizations, Department of Mathematics and Scientific Computing, University of Graz, Feb. 27, 2009

14. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, , Department of Mathematics and Scientific Computing, University of Graz, Feb. 26, 2009

15. Wavelets, joint sparsity, and image processing, FNRS Contact Group "Wavelets and applications", Universit libre de Bruxelles, Jan. 13, 2009.

16. Mathematics enters the picture, Department of Electronics and Informatics (ETRO), Vrije Universiteit Brussel, Jan. 13, 2009.

17. Mathematics enters the picture, Fraunhofer ITWM Bildverarbeitungslungen, Kaiserslautern, Jan. 12, 2009.

18. A kinetic model for flocking, Hong Kong City University, Dec. 11, 2008.

19. Compressive algorithms, variational principles, and free-discontinuity problems, Department of Mathematics, University of Rome "Tor Vergata", September 23, 2008.

20. ℓ_1 -minimization in compressive algorithms for PDEs and variational problems, Department of Mathematics, University of Pavia, Italy, May. 22, 2008.

21. L'applicazione, architetto della matematica. La matematica, architetto di nuove applicazioni (The application, architect of mathematics. Mathematics, architect of new applications), Faculty of Engineering,

University of Bologna, May 20, 2008.

22. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, (invited seminar for an Associate Professorship in Numerical Analysis), Institute for Numerical Simulation, University of Bonn, Germany, May 16 2008.

23. A comparison of joint sparsity and total variation minimization algorithms in a real-life art restoration problem, Centre de Mathematiques et de Leur Applications, CNRS and École Normale Supérieure de Cachan, France, May 15, 2008.

24. Domain decomposition methods for singular PDEs and applications in image processing, Laboratoire Jacques-Louis Lions, Université Pierre et Marie Curie, France, May 13, 2008.

25. ℓ_1 -minimization in compressive algorithms for PDEs and variational problems, Department of Mathematics, University of Milano, Italy, Apr. 22, 2008.

26. Iterative thresholding algorithms and acceleration methods, Department of Mathematics, Philipps-University of Marburg, Germany, Mar. 25, 2008.

27. Compressive algorithms, Numerical Analysis seminar, Department of Applied Mathematics and Theoretical Physics, Center of Mathematical Sciences (CMS) of the University of Cambridge, UK, Mar. 6, 2008.

28. Iterative re-weighted least square algorithms for compressed sensing, School of Mathematics, University of Edinburgh, UK, Mar. 3 2008.

29. Compressive algorithms, Department of Mathematics, University of York, UK, Feb. 29 2008.

30. Compressive algorithms and variational problems, Department of Mathematics, University of Trieste, Italy, Feb. 19, 2008

31. PDE methods in image processing, PDE group seminar, Radon Institute for Computational and Applied Mathematics, Linz, Austria, Jan. 28 2008.

32. Iterative thresholding algorithms for inverse problems with sparsity constraints, Harmonic Analysis and Signal Processing Seminar, Courant Institute of Mathematical Sciences, NY University, USA, April 30, 2007.

33. A unified approach to iterative thresholding algorithms for sparse recovery, Norbert Wiener Center Seminar, University of Maryland, College Park, USA, April 12, 2007.

34. Variational calculus, wavelets, and image processing, Radon Institute for Computational and Applied Mathematics (RICAM), Linz, Austria, Feb. 7 2006.

35. Tecniche di ricostruzione di segnali e di immagini digitali con metodi di interpolazione e variazionali con vincoli, Workshop “Modelli differenziali e tecniche numeriche nel trattamento delle immagini”, Department of Mathematics “Castelnuovo”, University of Rome “La Sapienza”, Apr. 15 2004.

36. Frame expansions for numerical analysis and signal/image processing. Applications in image pattern recognition and real world examples, “Graduiertenkolleg Angewandte Algorithmische Mathematik”, Technische Universität München, Zentrum Mathematik, Nov. 3 2003.

37. Introduzione alla teoria degli spazi coorbita quale interpretazione unificata delle decomposizioni di Gabor e wavelets e possibili estensioni, Department of Mathematics, University Bicocca in Milano, Jun. 10 2002.

38. Analisi tempo-frequenza e algoritmi di pattern matching nel 2D, Department of Mathematics, University of Verona, Jun. 5 2002.

39. Gabor-wavelet transform and discrete frames, Department of Mathematics, University of Udine, Oct. 19 2001.

40. Local construction of global frames and applications, Department of Mathematics, Technical University of Denmark, Lyngby, Denmark, August 6 2001.

41. Flexible Gabor-wavelet transforms and applications in PDEs and signal processing, Department of Pure and Applied Mathematics, University of Padua, July 12 2001.

42. Un metodo per la rappresentazione ed il confronto di immagini a meno di rotazioni. Un contributo alla ricostruzione virtuale degli affreschi della Chiesa degli Eremitani in Padova, Department of Pure and Applied Mathematics, University of Padua, March 13 2000.

3.6.4 Invited talks at conferences and workshops

1. Training reliably shallow neural nets from fewest samples, Workshop “Dimension reduction in physical and data sciences”, Duke University, 1-3 Apr. 2019
2. Spatially inhomogeneous evolutionary games, Workshop “Optimal Transportation and Applications”, Scuola Normale Superiore, 12-16 Nov. 2019
3. Learning and sparse control of multiagent systems, ERC-Conference on Optimal Transportation and Applications, Scuola Normale Superiore Pisa, Nov 5-11. 2016
4. A guided tour to algorithms of sparse recovery, Conference Cosera, Aachen, Sept 19-20 2016
5. Learning and sparse control of multiagent systems, 7th European Congress of Mathematics, July 18-21, 2016
6. Learning and sparse control of multiagent systems, Workshop in honor of the 75th birthday of Ron DeVore, Aachen, May 11-13 2016
7. Discretization of evolutions of critical points and applications in fracture simulation, DMV-GAMM Meeting, TU Braunschweig, March 08-09, 2016
8. Rotation invariance in exemplar-based image inpainting, DMV-GAMM Meeting, TU Braunschweig, March 08-09, 2016
9. Learning and sparse control of multiagent systems, Inter. Meeting “PDE Optimal Design and Numerical Methods”, Benasque, Spain, Aug. 23-27 2015
10. Consistency of probability measure quantization by means of power repulsion-attraction potentials, Yearly meeting of the German Mathematical Union, Sept. 23-24 2015
11. Mean-field sparse optimal control, Winter excursion TMP, Bayrischzell, Sept. 2, 2015
12. Linearly constrained evolutions of critical points and adaptive anisotropic remeshing in brittle fracture simulation, Workshop New Discretization Methods for the Numerical Approximation of PDEs, Oberwolfach Jan 14-16 2015
13. Consistency of probability measure quantization by means of power repulsion-attraction potentials, Conference Foundations of Computational Mathematics, Montevideo, Dec. 8-15, 2014
14. Consistency of probability measure quantization by means of power repulsion-attraction potentials, SFB-Meeting Discretization in Geometry and Dynamics, Sept. 24-26 2014
15. Consistency of probability measure quantization by means of power repulsion-attraction potentials, Workshop Time-Frequency Analysis, Erwin Schrodinger Institute, Vienna, Jan 12-15 2014
16. Quasilinear compressed sensing, Matheon Workshop CSA 2013, Dec. 11-13 2013
17. Sparse mean-field optimal control, Workshop Mean field games and related topics - 2, University of Padova, Sept. 4-6 2013
18. Sparse stabilization and optimal control of consensus models, Oberwolfach conference Multiscale and High-Dimensional Problems, July 29 - Aug 3, 2013
19. Linearly constrained nonsmooth and nonconvex minimization, Conference New Computational Methods for Inverse Problems, Ecole Normale Supérieure de Cachan, Paris
20. Sparse stabilization and optimal control of consensus models, Workshop in honor of the 60th birthday of Heinz Engl and of the 10 years of RICAM, Johann Radon Institute, March 26-29 2013
21. Sparse stabilization and optimal control of the Cucker-Smale model, Workshop: Algorithms and Complexity for Continuous Problems, Dagstuhl, Sep. 23-28 2012
22. Learning functions of few arbitrary linear parameters in high dimension, Workshop “Probabilistic techniques and algorithms”, University of Texas in Austin, Apr. 7, 2012
23. Variational dithering, kinetic consistency, and a new deconvolution method, Symposium on Total Variation, Technical University of Munich, Feb. 2, 2012
24. Particle systems and kinetic equations modeling interacting agents in high-dimension, Workshop “Functional Inequalities and PDE in the Life Sciences”, Université Paris Dauphine, Jan. 12-13, 2012
25. Particle systems and kinetic equations modeling interacting agents in high-dimension, Workshop “Numerical Analysis of Multiscale Problems and Stochastic Modelling”, RICAM, Linz, Dec. 16, 2011
26. Domain decomposition methods for total variation minimization, Int. Conf. on Scientific Computing, Cagliari, Oct. 3-9, 2011

27. Inverse free-discontinuity problems and iterative thresholding algorithms, Modern Methods and Applications of the Calculus of Variations: Image Processing - Part I of V, ICIAM, Vancouver, July 19, 2011
28. Mathematics enters the picture: Mantegna's frescoes in Padua and their computer assisted restoration, Computational Methods for the Cultural Heritage, ICIAM, Vancouver, July 19, 2011
29. Learning functions of few arbitrary linear parameters in high dimension, Found. Comput. Math., Budapest, July 6, 2011
30. New applications of compression in numerical simulation in high dimension, From Abstract to Computational Harmonic Analysis, Strobl, June 13 - 19, 2011
31. Particle systems and kinetic equations modeling interacting agents in high-dimension, Banff, Mar. 5 - 12, 2011
32. Particle systems and kinetic equations modeling interacting agents in high-dimension, Dagstuhl, Jan. 30 - Feb. 04, 2011
33. Particle systems and kinetic equations modeling interacting agents in high-dimension, PDEs in kinetic theories: kinetic description of biological models, ICMS, Edinburgh, Nov. 9, 2010
34. Inverse free-discontinuity problems and iterative thresholding algorithms, Emerging Topics in Dynamical Systems and Partial Differential Equations - DSPDE's, Barcelona, May 31 - June 4 2010
35. Inverse free-discontinuity problems and iterative thresholding algorithms, SIAM Conference on Imaging Science (IS10), Chicago, U.S.A., April 12-14, 2010
36. Subspace correction methods for ℓ_1 and total variation minimization, SIAM Conference on Imaging Science (IS10), Chicago, U.S.A., April 12-14, 2010
37. Inverse free-discontinuity problems and iterative thresholding algorithms, AIP 2009, Vienna, July 21, 2009
38. Multilevel preconditioning in inverse problems with sparsity constraints, AIP 2009, Vienna, July 21, 2009
39. Inverse free-discontinuity problems and iterative thresholding algorithms EPSRC Symposium Capstone, Warwick Mathematical Institute, UK, June 30 – July 3, 2009.
40. Iterative thresholding: domain decompositions, multilevel preconditioning, and adaptivity, Tomography with Wavelets, Observatoire Océanologique, Villefranche-sur-Mer, France, May 28-30 2009.
41. A kinetic model of flocking, Workshop on Modern Topics in Nonlinear Kinetic Equations, University of Cambridge, UK, April 20-22, 2008.
42. Domain decomposition methods for total variation minimization, The Third International Conference on Scientific Computing and Partial Differential Equations at Hong Kong Baptist University, Hong Kong, Dec. 8-12, 2008.
43. Subspace decomposition method for very large scale sparse optimizations, Structured Decompositions and Efficient Algorithms, Dagstuhl Seminar, Germany, Nov. 30 – Dec. 5, 2008.
44. A kinetic model for flocking, Kinetic modelling for socio-economic and related problems, Vigevano, Italy, November 27-29, 2008.
45. Hot topics Workshop: Multi-Manifold Data Modeling and Applications, Institute for Mathematics and its Applications (IMA), University of Minnesota, U.S.A., October 27-30 2008.
46. Modern harmonic analysis and PDEs methods for visual art restoration, Modelling and Numerics for Monuments Conservation, University of Orleans, France, Sept. 4-5 2008.
47. Image and Signal Processing, Foundations of Computational Mathematics (FoCM08), Hong-Kong, China, Jun. 24-26, 2008.
48. Modern methods of harmonic analysis and PDEs in mathematical imaging, Mathknow08 - Mathematics, Applied Sciences, and Real Life, MOX - Technical University of Milan, Italy, May 23, 2008.
49. Inverse problems and sparsity measures, Minisymposium Inverse Problems with Sparsity Constraints, GAMM 2008, Bremen, Germany, Mar. 31 – Apr. 4, 2008.
50. Compressive algorithms: beyond adaptive wavelet methods in PDEs, Workshop on "Adaptive Numerical Methods for PDEs", Wolfgang Pauli Institute, Vienna, Austria, Jan. 21-25 2008.
51. Mathematical tools in signal processing and sparse optimization, Co. ESTECO S.r.l. www.esteco.com, Area Science Park, Trieste, Italy, December 14, 2007.

52. Evaluation of the project “Mathematical Methods for Image Analysis and Processing in the Visual Arts”, WWTF, Vienna, Austria, December 5 2007.

53. Mathematics and art restoration, Institut für Konservierung und Restaurierung, Akademie der bildenden Künste Wien, Vienna, Austria, November 9 2007.

54. von Neumann Symposium “Sparse Representation and High-Dimensional Geometry”, July 8-12, 2007

55. Recovery algorithms for vector valued data with joint sparsity constraints, Sparse Approximation Workshop, Nov. 10-12 2006, Princeton University, USA.

56. Frame adaptive methods for signal processing and operator equations, Workshop “Time-frequency analysis and stationary filtering”, BIRS, Banff, Canada, Sept. 24-29 2005.

57. Some applications of localization of frame theory, Mathematisches Forschungsinstitut Oberwolfach, Feb. 18 2004.

58. Proposta per una anastilosi informatica degli affreschi della Cappella Ovetari nella Chiesa degli Eremitani in Padova, Consiglio di amministrazione della Fondazione Cassa di Risparmio di Padova e Rovigo, July 21 2000.

3.6.5 Contributed conference presentations

1. Subspace correction methods in sparse optimization, Workshop “Inverse Problems in Medical Imaging”, Universitätszentrum Obergurgl, Austria, Jan. 22-27 2008.

2. Accelerated iterative thresholding algorithms, Conference on Applied Inverse Problems 2007: Theoretical and Computational Aspects, June 25-29, 2007.

3. Sparse recovery, free-discontinuity problems and image inpainting, Workshop on “PDEs and Variational Tools in Image Inpainting”, Wolfgang Pauli Institute, Vienna, Austria, June 11-13, 2007.

4. Faithful recovery of vector valued functions from incomplete data. Recolorization and art restoration, Scale Space Variational Methods 2007, Ischia, Italy, May 30 - June 2, 2007.

5. Fast reconstruction algorithm for sparse multivariate and vector valued data, 1st Dolomites workshop on constructive approximation and applications, Sept. 8-12 2006, Alba di Canazei, Italia.

6. Variational methods, inpainting, and art restoration, Int. Conf. “Nonlinear PDEs: Homogenization and Kinetic Equations”, Vienna, Austria, June 26-30 2006.

7. Linear inverse problems with joint sparsity constraints, Mini-workshop “Sparsity and Applications”, Radon Institute for Computational and Applied Mathematics (RICAM), Linz, Austria, June 21 2006.

8. Fast algorithms for inverse problems with joint sparsity constraints, Int. Conf. Recent Progress in Spline and Wavelet Approximation, University of Rome La Sapienza, June 14-16 2006.

9. Metodi di campionamento non uniforme e variazionali per il restauro di immagini, Convegno nazionale GNCS, Dipartimento di Matematica F. Enriques, University of Milano, 14-16 febbraio 2006.

10. Adaptive algorithms. Mobile digital signal transmission, Int. Conf. MathMod, Vienna, Austria, February 8-10 2006.

11. On elementary sampling theorems on bounded domains, Int. Conf. ICNAAM 2005, Rodos, Greece, Sept. 16-20 2005.

12. Int. Conf. SampTA2005, Sampling Theory and Applications, Samsun, Turkey, July 10-15 2005.

13. Frames, greedy algorithms, and operator equations, Special Semester “Modern Methods of Time-Frequency Analysis”, Third Workshop “Nonorthogonal expansions and greedy algorithms”, Erwin Schroedinger Institute, Vienna, Austria, June 6-11 2005.

14. Frames, greedy algorithms, and operator equations, Int. Conf. “Modern Methods of Time-Frequency Analysis”, Strobl, Austria, May 23-28 2005.

15. Image processing, greedy algorithms, and operator equations, HASSIP midterm meeting, Vienna, Austria, April 26-27 2005.

16. Adaptive frame methods for magnetohydrodynamic flows, MASCOT04 4th Meeting on Applied Scientific Computing and Tools (Grid generation, approximation, and visualization), Florence, Italy, Nov. 25-27 2004.

17. Frame decompositions in image processing: applications in art restoration, SIMAI 2004, Isola di San Servolo, Venice, Italy, Sept. 20-24 2004.

18. Construction of smooth (wavelet) frames and their applications, Int. Conf. Classical and New Approximation Spaces: Theory and Applications, Rome, Italy, Feb. 5-7 2004.
19. Interpolation of Banach spaces by means of Gabor-wavelet frames, Int. Conf. Wavelets and Splines, S. Petersburg, Russia, July 2-8 2003.
20. Flexible Gabor-wavelets decompositions for L2 Sobolev spaces, Int. Conf. SampTA2003, Sampling Theory and Applications, Strobl, Austria, May 2003.
21. Fast registration methods based on local circular harmonic frames and applications to art frescoes restoration, GAMM2003 (Conference of Gesellschaft fuer Angewandte Mathematik und Mechanik e. v. 2003), Abano Terme, Italy, 24-28 March 2003.
22. Fast homogenization algorithm based on asymptotic theory and multiscale schemes, GAMM2003 (Conference of Gesellschaft fuer Angewandte Mathematik und Mechanik e. v. 2003), Abano Terme, Italy, March 24-28 2003.
23. Flexible Gabor-wavelet continuous and discrete frames in alpha-modulation spaces, 2nd Int. Gabor Workshop, Vienna, Austria, Dec. 3-7 2002.
24. Generalized structured frame expansions: a bridge from Gabor to wavelet theory, kick-off meeting of the EU-network RTN HASSIP (Harmonic Analysis and Statistics for Signal and Image Processing) HPRN-CT-2002-00285, Department of Mathematics, University of Provence, Marseille, France, Nov. 14-16 2002.7
25. Un algoritmo di omogeneizzazione veloce basato sulla teoria asintotica e su schemi multiscala, "Convegno nazionale di Analisi Numerica: stato dell'arte", Arcavacata di Rende, University of Calabria, Sept. 26-28 2002.
26. Decompositions of Hilbert spaces: local construction of global frames, Int. Conf. Constructive Function Theory, Varna, Bulgaria, June 19-23 2002.

3.6.6 Invited public lectures

1. Mantegna ricostruito. Un dialogo tra arte, matematica e nuove tecnologie, (with Chiara Franceschini. LMU), Istituto Italiano di Cultura, July 1 2019
2. Andrea Mantegna. La Matematica in soccorso dell'arte ed altre avventure matematiche nel restuaro, University of Trento and MuSe, June 1, 2017.
3. Andrea Mantegna. La Matematica in soccorso dell'arte ed altre avventure matematiche nel restuaro, FAI sezione di Belluno, Feb. 28, 2017
4. Mathematics reconstructing Art, at the Nasher Museum of Art at Duke University, Oct. 11, 2012
5. Mathematics Enters the Picture, Symposium "Computational Mathematics: The Quiet Invaders", Vienna, Oct. 23, 2012
6. Mathematics Enters the Picture - The Restoration of Mantegna's Frescoes in Padua, öffentlicher Vortrag im Rahmen der Klassensitzung der mathematisch-naturwissenschaftlichen Klasse der ÖAW, October 15 2010.
7. Marie Curie International Fellowships, workshop on PEOPLE 4 YOU, BMWF – neue Medienräume, Vienna, Austria, May 13 2009.
8. Il Progetto Mantegna a Padova (The Mantegna Project in Padua), Conferenza Matematica e Cultura 2009, Auditorium Santa Margherita, University Ca Foscari of Venice, March 27, 2009.
9. Mathematics enters the picture, Interdisziplinäres Dialogforum (ID) – Kick-off, Senatssaal, University of Vienna, Dec. 4, 2008.
10. Matematica e applicazioni all'arte e alla tecnologia (Mathematics and applications in art and technology), presentation of the book "Matematici al lavoro" (Mathematicians at work), Department of Mathematics, University of Milano, Italy, Apr. 22, 2008.
11. Matematica e Arte (Mathematics and Art), Istituto Comprensivo di Correzzola, Comune di Candiana, Candiana, Italy, December 15, 2007.
12. Marie Curie Outgoing International Fellowship, workshop on PEOPLE & IDEAS - Projekte im 7. EU-Rahmenprogramm, Österreichische Akademie der Wissenschaften, Vienna, Austria, December 7 2007.

13. Il “Progetto Mantegna” a Padova e Sviluppi (The Mantegna Project in Padua and Developments), University for Adult People, Belluno, Italy, December 21 2006.

14. Presentazione nazionale del “Progetto Mantegna” (National presentation of the Mantegna Project), Salone Internazionale del Restauro, Fiera di Ferrara, Italy, Mar. 29 2001.

3.7 Teaching

Beside standard teaching duties as reported in Section 3.7.2, I’m delivering on a regular bases invited doctoral courses at international universities, see Section 3.7.1.

In the past years, I have been the initiator and the director of the Data Science initiative at the Department of Mathematics of TUM. In particular, I activated, jointly with Computer Science, the Master of Mathematics in Data Sciences (see <http://www.data-master.tum.de/>). This initiative attracted enormous attention and promises to be a great success, with already more than 160 student applications for the winter semester 2018.

I’m also the responsible person for the TUM Data Innovation Lab (<http://www.di-lab.tum.de/>): TUM-DI-LAB is a summer (or winter) educational research experience that welcomes TUM masters students from ANY department interested in exploring new data-driven approaches to interdisciplinary challenges. Students work in small project teams and learn how to marshal, analyze, and visualize data while acquiring exposure to the modern world of data science. Every semesters more than 100 students apply for the TUM-DI-LAB.

3.7.1 Invited short - doctoral- courses

1. Foundations of Data Analysis, 24 hour course, University of Padova, 11-22 March 2019
2. Mean-Field optimal control and other types of games, 6 hour doctoral course, Autumn School “From interacting Particle systems to Kinetic equations”, University of Verona, 26- 30 Nov. 2018
3. Foundations of Data Analysis, 12 hour course, University of Trento, Oct.-Dec. 2018
4. Applied harmonic analysis, 6 hours course, TopMath School of Advanced Mathematics for Young Students, Technical University of Munich, Sept. 2018
5. History, theory and applications of wavelets, 6 hour course, Accademia dei Lincei and Scuola Normale Superiore, Pisa, Mar. 1-2,9, 2018
6. Multi-agent System Learning and Control, 4 hour course, Particle School 2018 “From Particle Dynamics to Gradient Flows”, TU Kaiserslautern, Feb. 18-20 2018
7. Foundations of Data Analysis, 12 hour course, University of Trento, Nov. 2017 - Jan. 2018
8. Multi-agent System Learning and Control, 10 hour course, Duke University, Nov, 12-19, 2017
9. Multi-agent System Learning and Control, 10 hour course, Summer School of Mathematical Physics in Ravello, Sept. 4-8, 2017
10. Consistency of measure quantization via variational methods, 6 hour course, Universidad de Buenos Aires, 31 July - 5 August 2017
11. Multi-agent System Learning and Control, 10 hour course, University of Ferrara, June 26-30, 2017
12. Multi-agent System Learning and Control, 10 hour course, Johns Hopkins University, Mar. 16.-23, 2017
13. Multi-agent System Learning and Control, 10 hour course, National University of Seoul, Korea, Dec. 17.-24, 2016

14. Compressed sensing, 8 hour course, Simular Research Laboratory, Oct. 03-06, 2016
15. Learning sums of ridge functions: a nonlinear compressed sensing model, 4 hour course, Winter School on Compressed Sensing, TU Berlin, Dec. 03-05 2015
16. From sparse optimization to sparse optimal control, 12 hour course, University of Padova, June 07-18 2015
17. From sparse optimization to sparse optimal control, 12 hour course, University of Graz, Apr. 12-22, 2015
18. Numerical methods for sparse recovery, 10 hour course, Fields Institute, Toronto, Canada, May 14-16, 2012
19. Numerical methods for sparse recovery, 10 hour course, University of Milano, Mar. 12-16, 2012
20. Numerical methods for sparse recovery, 5 hour course, Spring School, University of Aveiro, Portugal, Mar. 27 - Apr. 01 2011
21. Numerical methods for sparse recovery, 5 hour course, Summer School on "Theoretical Foundations and Numerical Methods for Sparse Recovery" held at the Johann Radon Institute for Computational and Applied Mathematics (RICAM), Linz - Austria, on August 31 - September 4, 2009
22. Sparse recovery algorithms from exact and incomplete data, 6 hour course, Dolomites Research Week on Approximation 2007, Sept. 4-6 2007, University of Verona, Alba di Canazei, Italy.
23. Mathematical modelling, 6 hour course, WS07-08 (January 7,14 2008), University of Vienna, Vienna, Austria.

3.7.2 Regular teaching

1. Foundations of Data Analysis, SS19, Technical University of Munich, Germany
2. Mathematical Foundations of Artificial Neural Networks, WS1819, Technical University of Munich, Germany
3. Case Studies of Mathematical Modeling, WS1819, Technical University of Munich, Germany
4. Foundations of Data Analysis, SS18, Technical University of Munich, Germany
5. Modeling and Simulation with ODE for MSE, WS1718, Technical University of Munich, Germany
6. Case Studies of Mathematical Modeling, WS1718, Technical University of Munich, Germany
7. Foundations of Data Analysis, SS17, Technical University of Munich, Germany
8. Modeling and Simulation with ODE for MSE, WS1617, Technical University of Munich, Germany
9. Sparse Control of Multiagent Systems, SS16, Technical University of Munich, Germany
10. Measure and Integration Theory, WS1516, Technical University of Munich, Germany
11. SS15: Sabbatical semester
12. Case Studies of Mathematical Modeling, WS1415, Technical University of Munich, Germany
13. Modeling and Simulation with ODE for MSE, WS1415, Technical University of Munich, Germany
14. Numerical Programming 2 (CSE), SS14, Technical University of Munich, Germany
15. Case Studies of Mathematical Modeling, WS1314, Technical University of Munich, Germany

16. Measure and Integration Theory, WS1314, Technical University of Munich, Germany
17. Numerical Analysis of Ordinary Differential Equations, SS13, Technical University of Munich, Germany
18. Calculus of Variations on BV functions, WS1213, Technical University of Munich, Germany
19. Numerical methods for sparse recovery, SS12, Technical University of Munich, Germany
20. Numerics of differential equations, WS1112, Technical University of Munich, Germany
21. Bounded variation functions and variational problems in imaging, special course, SS11, Technical University of Munich, Germany
22. Calculus of variations and geometric measure theory, special course, SS10, University of Vienna, Austria
23. Project seminar Discontinuous Galerkin Method for Total Variation minimization attached to the course of Numerical Methods for Elliptic PDEs (Ulrich Langer), SS10, Johannes Kepler University, Linz, Austria
24. Inverse problems in mathematical imaging, regular course, WS09-10, University of Padua, Italy
25. Project seminar Discontinuous Galerkin Method for Total Variation minimization attached to the course of Numerical Methods for Elliptic PDEs (Ulrich Langer), SS09, Johannes Kepler University, Linz, Austria
26. Recent advances in numerical harmonic analysis, regular course, SS08, University of Padua, Italy
27. Variational methods for free-discontinuity problems and sparse recovery, special course, WS07-08, Johannes Kepler University, Linz, Austria
28. Recent advances in numerical harmonic analysis, regular course, SS07, University of Padua, Italy
29. Numerical analysis laboratory, assistant, SS06, University of Rome “La Sapienza”, Italy (large class at Engineering Fac.)
30. Numerical analysis laboratory, assistant, SS05, University of Rome “La Sapienza”, Italy (large class at Engineering Fac.)
31. Mathematics for signal and image processing, regular course, WS03-04, University of Padua, Italy
32. Numerical harmonic analysis, regular course, WS02-03, University of Padua, Italy
33. Calculus I, assistant, WS99-00, University of Padua, Italy (large class at Engineering Fac.)

3.8 Students

I'm collecting the experiences of my students, together with their downloadable theses, at the web pages:

- <https://www-m15.ma.tum.de/Allgemeines/MasterThesis>
- <https://www-m15.ma.tum.de/Allgemeines/PhDThesis>

I'm proudly mentioning that most of my PostDocs obtained tenure track or permanent positions at other international universities (see details below).

3.8.1 Best Master students

Alina Leidinger, June 2019

Technical University of Munich

Thesis “Mathematical Analysis of Neural Networks”

Grades: 1.0

Adrian Leidinger, Dec. 2018

Technical University of Munich

Thesis “Simulation-Based Reinforcement Learning of Complex Reflexes for Low-Level Robotic Systems”

Grades: 1.0

Nathanael Bosch, Oct. 2018

Technical University of Munich

Thesis “Evolutionary Games for Global Function Minimization”

Grades: 1.0

Michael Rauchensteiner, Jun. 2018

Technical University of Munich

Thesis “Learning two layer neural networks by fewest samples”

Grades: 1.0

Judith Wewerka, Jun. 2018 (first graduated student of the Master of Mathematics in Data Science)

Technical University of Munich

Thesis “Near-Optimal Data-Driven ℓ_1 -Regularization”

Grades: 1.0

Michael Heining, Apr. 2017

Technical University of Munich

Thesis “Dynamical Learning: Case Study on Tic-Tac-Toe”

Grades: 1.3

Markus Stachl, Apr. 2017

Technical University of Munich

Thesis “Modelling and control of traffic flow on networks”

Grades: 1.0

Manuel Bergler, Dec. 2015

Technical University of Munich

Thesis “Simulation and Control in High-Dimension of Repulsion-Attraction Systems”

Grades: 1.0

Johannes Piendl, Sept. 2015

Technical University of Munich

Thesis “Learning a Manifold from Functional Data in Low Dimension”

Grades: 1.0

Christian Kümmerle, Sept. 2015

Technical University of Munich

Thesis “Learning Functions in High-Dimension”

Grades: 1.0

Martin Eller, September 2013

Technical University of Munich

Thesis “Rotation Invariance in Exemplar-Based Inpainting”

Grades: 1.0

Jan-Christian Hütter, July 2013

Technical University of Munich

Thesis “Minimizers and Gradient Flows of Attraction-Repulsion Functionals with Power Kernels and Their Total Variation Regularization ”

Grades: 1.0

Juliane Sigl, April 2013

Technical University of Munich

Thesis “Quasi-linear Compressed Sensing”

Grades: 1.0

Ilaria Patuzzi, February 2010 (co-supervisor Dr. Fabio Marcuzzi)

Laurea in Mathematics, University of Padua, Italy

Thesis (Italian) “Algoritmi di thresholding iterativo e riconoscimento della corrosione”

Grades: summa cum laude

Rocco Cazzato, October 2007 (co-supervisor Prof. Ruggero Frezza)

Laurea in Information Engineering, University of Padua, Italy

Thesis (Italian) “Un metodo per la ricolorazione di immagini e altri strumenti per il restauro - Il Progetto Mantegna e gli affreschi nella chiesa degli Eremitani”

Grades: best grades for an experimental thesis

Giulia Erica Valente, November 2006 (co-supervisor Dr. Fabio Marcuzzi)

Laurea in Mathematics, University of Padua, Italy

Thesis (Italian) “Gabor frames: teoria e algoritmi”

Grades: summa cum laude

3.8.2 Doctoral students

Philippe Suennen

Technical University of Munich

Apr 2019 –

Michael Rauchensteiner

Technical University of Munich

Aug 2018 –

Laure Vuaille

Technical University of Munich

Jan 2018 –

Sandro Belz

Technical University of Munich

May 2016 –

Thesis “Modelling and Simulation for Brittle Fracture of Thin Shells subject to Normal Displacements”

Johannes Maly

Technical University of Munich

Jan 2016 – Jan. 2019

Thesis “Recovery Algorithms for Quantized Compressed Sensing”

Juliane Sigl

Technical University of Munich

July 2013 – April 2018

Thesis “Iteratively Reweighted Least Squares - Nonlinear Regression and Low-Dimensional Structure Learning for Big Data”

Mattia Bongini

Technical University of Munich

Jan. 2013 – July 2016

Thesis “Sparse Optimal Control of Multiagent Systems”

Marco Artina

Technical University of Munich

Sept. 2012 – Dec. 2015

Thesis “Lagrangian Methods for Constrained Non-Convex Minimizations and Applications in Fracture Mechanics”

Steffen Peter

Technical University of Munich

Apr. 2012 – Oct. 2016

Thesis “Algorithms for Robust and Fast Sparse Recovery: New Approaches Towards the Noise Folding Problem and the Big Data Challenge”

Andreas Langer

Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA

Feb. 2008 – Sept. 2011

Thesis “Subspace Correction and Domain Decomposition Methods for Total Variation Minimization”

Contribution to the supervision of the Ph.D. work of Rachel Ward (advisor Prof. Ingrid Daubechies, Program in Applied and Computational Mathematics, Princeton University, U.S.A.), and Carola-Bibiane Schönlieb (advisor Prof. Peter A. Markowich, Department of Applied Mathematics and Theoretical Physics (DAMTP), Centre for Mathematical Sciences, University of Cambridge, U.K.).

3.8.3 PostDocs

@ TUM

Hui Huang (Mathematics, Tsinghua University, Beijing, China)

Technical University of Munich

Munich, GERMANY

May 2019 –

Stefano Almi (Doctoral studies at SISSA, Italy)

Technical University of Munich

Munich, GERMANY

Sept 2016 – Apr 2019

Now PostDoc at the University of Vienna (Austria)

Markus Hansen (Doctoral studies at the Friedrich-Schiller University of Jena, Germany)

Technical University of Munich

Munich, GERMANY

Feb. 2014 –

Now PostDoc at the University of Marburg (Germany)

Marco Morandotti (Doctoral studies at SISSA, Italy)

Technical University of Munich

Munich, GERMANY

Dec 2016 –Sept. 2018

Now Assistant Professor at Univ. Turin (Italy) <http://marcomorandotti.weebly.com/>

Young-Pil Choi (Doctoral studies at the National University of Seoul, Korea)

Technical University of Munich

Munich, GERMANY

Feb 2016 –Feb 2017

Now Assistant Professor at Inha Univ. (Korea) <http://math.inha.ac.kr/~ypchoi/>

Giacomo Albi (Doctoral studies at the University of Ferrara, Italy)

Technical University of Munich

Munich, GERMANY

May 2014– Mar. 2017

Now Assistant Professor at Univ. Verona (Italy) <http://www.di.univr.it/?ent=persona&id=35835&lang=it>

Benjamin Scharf (Doctoral studies at the Friedrich-Schiller University of Jena, Germany)

Technical University of Munich

Munich, GERMANY

Mar. 2013 – Jan. 2015

Now at <https://de.linkedin.com/in/dr-benjamin-scharf-866a1633>

Analysis of PDE group @ RICAM

Renjun Duan (Doctoral studies at City University Hong Kong)

Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA

October 2008 – September 2012

Now Assistant Professor at City U Hong Kong <http://www.math.cuhk.edu.hk/~rjduan/>

Massimo Fonte (Doctoral studies at S.I.S.S.A., Trieste, Italy)

Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA

April 2006 – March 2010

Francesco Solombrino (Doctoral studies at S.I.S.S.A., Trieste, Italy)

Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA

November 2011 – Sept. 2013

Now Assistant Professor at Univ. Naples (Italy) <https://www.docenti.unina.it/francesco.solombrino>

Francesco Vecil (Doctoral studies at the Autonomous University of Barcelona, Spain)

Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA

October 2008 – September 2009

Now tenured at <http://francescovecil.it/>

START Project team (<http://hdspare.ricam.oeaw.ac.at/>)

Dante Kalise (Doctoral studies at the University of Bregem, Norway)
Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA

May 2013 – May 2014

Now at Imperial College London <https://www.imperial.ac.uk/people/d.kalise-balza>

Jan Haskovec (Doctoral studies at the University of Vienna, Austria)

Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA

July 2009 – April 2012

Now at KAUST https://www.researchgate.net/profile/Jan_Haskovec2

Yunho Kim (Doctoral studies at UC Los Angeles, U.S.A.)

Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA

July – Sept. 2009

Now tenured at <https://yunhokim.wordpress.com/>

Karin Schnass (Doctoral studies at the Ecole Polytechnique Fédérale de Lausanne, Switzerland)

Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA

January 2010 – June 2012

Now Assistant Professor at <https://applied-math.uibk.ac.at/cms/index.php/staff/263-dr-karin-schnass>

Jan Vybiral (Doctoral studies at the Friedrich-Schiller University of Jena, Germany)

Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA

October 2009 – April 2012

Now tenured at <http://people.fjfi.cvut.cz/vybirja2/index.php>

3.9 Approved grants, external projects

In the course of my career I have been able to sustain my research activity mainly by means of third party funding for a total of ca. 5 millions of EUR.

DFG-Project Deutsche Forschungsgemeinschaft

Project title “Learning and Recovery Algorithms for Multi-Sensor Data Fusion and Spectral Unmixing in Earth Observation”

PI: M. Fornasier, G. Kramer, and X. Zhu

3 years

Amount 123.600 EUR

FNR Fonds National de la Recherche Luxembourg

Project title “Mathematical Analysis of Training Neural Networks ”

PI: M. Fornasier

3 years

Amount 130.000 EUR

DFG-Project Deutsche Forschungsgemeinschaft

Project title “Identification of Energies from Observations of Evolutions”

PI: M. Fornasier
3 years
Amount 267.800 EUR

DFG-Project Deutsche Forschungsgemeinschaft

PIs: M. Fornasier and G. Kutyniok

3 years
Amount 332.500 EUR

DFG-Project Deutsche Forschungsgemeinschaft

Project title “Information Theory and Recovery Algorithms for Quantized and Distributed Compressed Sensing”

PIs: M. Fornasier and G. Kramer

3 years
Amount 179.000 EUR

DFG-Project Deutsche Forschungsgemeinschaft, D-A-CH project with RICAM

Project title “Multi-parameter regularization for lifting the curse of dimensionality”

PIs: M. Fornasier, V. Naumova, and S. Pereverzyev

Feb. 2015 - Jan. 2018

Amount 173.800 EUR (the part given to TU-Munich)

DAAD Procope (bilateral project with France)

Project title “Sparse Control of Multiscale Models of Collective Motion”

PIs: M. Fornasier and F. Rossi

Jan. 2014 - Dec. 2015

Amount 9.000 EUR (the part given to TU-Munich)

ERC-Starting Grant (ERC - European Research Council)

Project title “High-Dimensional Sparse Optimal Control”

PIs: Massimo Fornasier

Dec. 2012 - Nov 2017

Amount 1.123.000 EUR

Research Project (DFG -Deutsche Forschungsgemeinschaft)

Project title “Optimal Adaptive Numerical Methods for p-Poisson Elliptic equations”

PIs: Stephan Dahlke, Massimo Fornasier, Lars Diening

Jun. 2012 - May 2015

Amount 7.200 EUR

International Research Training Group IGDK 1754(DFG - Deutsche Forschungsgemeinschaft and FWF - Fonds zur Förderung der wissenschaftlichen Forschung)

Project title “Lagrangian Methods for Constrained Nonconvex Minimizations and Applications in Fracture Mechanics ”

PIs: M. Fornasier and K. Kunisch

Mar. 2012 - Feb. 2016

Amount c.a. 270.000 EUR

Munich Aerospace - Fakultät für Luft- und Raumfahrt e.V.

Project title “Sparse Reconstruction and Compressive Sensing for Remote Sensing and Earth Observation”

PIs: R. Bamler, M. Fornasier and X. Zhu

Mar. 2012 - Feb. 2016

Amount 200.000 EUR

START award (FWF - Fonds zur Förderung der wissenschaftlichen Forschung)

Project title “Sparse Approximation and Optimization in High-Dimensions”

PI: M. Fornasier

Apr. 2009 - June. 2015

Amount 1.137.860 EUR

WWTF “Five Senses - Call 2006” (4 years), Project Mathematical Methods for Image Analysis and Processing in Visual Arts

Nov. 2006 - Oct. 2010

PIs: W. Baatz, M. Fornasier, B. Kowanz, P. Markowich

Amount: 400.000 EUR

Marie Curie Outgoing International Fellowship (contract MOIF-CT-2006-039438, 18 months) of the European Commission (6th Framework Programme)

Project “Sparse Approximation for Blind Source Separation”

Oct. 2006 - March 2008

PI: M. Fornasier

Amount: 120.000 EUR

Individual Marie Curie Fellowship (contract MEIF-CT-2004-501018, 2 years) of the European Commission (6th Framework Programme)

Project “Flexible Time-Frequency Decompositions and Adaptive Treatment of Operator Equations by Frames”

May 2004 - April 2006

PI: M. Fornasier

Amount: 130.000 EUR

Mantegna Project (3 years) Fondazione Cassa di Risparmio di Padova e Rovigo and University of Padua

Oct. 2001 - Sept. 2004

PIs: M. Fornasier and D. Toniolo

Amount: 525.000 EUR

3.10 Other activities

3.10.1 Conference, workshop, meeting organization

1. 2020 Co-organization (with C. Agostinelli, L. Rosasco, and R. Willet) Summer Doctoral School “Machine Learning: From Data to Mathematical Understanding”, Centro Internazionale Matematico Estivo, Levico Terme
2. 2016 Co-organization (with M. Maggioni, H. Rauhut, and T. Strohmer) of the Special Trimester Program Mathematics of Signal Processing, Hausdorff Research Institute for Mathematics, Bonn, Jan.-Apr. 2016; this event has been attended by more than 100 scientist and more than 60 young researchers from all over the world
(<https://www.him.uni-bonn.de/programs/past-programs/past-trimester-programs/signal-processing-2016/description/>)
3. 2015 Co-organization (with D. Kalise) of the Minisymposium “Modeling and Control of Multi-agent Systems”, 27 th IFIP TC7 Conference 2015 on System Modelling and Optimization, Sophia Antipolis, June 29-July 3, 2015
4. 2015 Co-organization (with V. Naumova) of the Special Session “Learning subspaces”, AIP 2015, Helsinki, May 24-29 2015

5. 2015 Co-organization (with G. Albi) of the Special Session “Mean-field models and control of multi-agent systems”, 13th Vienna Workshop on Optimal Control and Dynamic Games, May 11-16 2015
6. 2014 Co-organization (with Boris Vexler) of the Special Session “Sparse optimization and optimal control in dynamical systems and PDEs” at AIMS DSDEA July 7-11, 2014, Madrid
7. 2014 Minisymposium “Linear Algebra and Compressed Sensing” at the annual GAMM conference, March 10-14, 2014, Erlangen, Germany.
8. 2013 Co-organization (with Philipp Grohs and Rachel Ward) of the Minisymposium “Approximation, compression, and data analysis” at ENUMATH 2013, Lausanne August 26-30, 2013
9. 2013 Co-organization (with Hans-Joachim Bungartz, Patrick Dewilde, Markus Hegland, Thomas Huckle, and Miriam Mehl) of the TUM-IAS Workshop on “Novel Numerical Methods - Shifting the Borders of Computability”, Munich, July 29 - Aug. 3 2013.
10. 2012 Symposium on Total Variation, (jointly with Daniel Cremers), Technical University of Munich, Feb. 6, 2012
11. 2011 Workshop “Numerical Analysis of Multiscale Problems and Stochastic Modelling”, (jointly with Ivan G. Graham, Markus Melenk, Robert Scheichl, and Jörg Willems), at the Johann Radon Institute for Computational and Applied Mathematics (RICAM), Linz - Austria, December 12-16, 2011
12. 2011 Foundations of Computational Mathematics Conference, co-organizer (jointly with Martin Buhmann and Nira Dyn) of the minisymposium “Approximation theory”, Budapest
13. 2010 Workshop “Sparsity and Computation”, co-organizer (jointly with Ronald DeVore and Holger Rauhut), Hausdorff Center for Mathematics Bonn, June 7-11, 2010, Bonn, Germany
14. 2010 Minisymposium “Particle and Mean Field Models for Flocking and Swarming” co-organizer (with Alethea Barbaro), Emerging Topics in Dynamical Systems and Partial Differential Equations DSPDEs’10, May 31 - June 4, 2010, Barcelona, Spain
15. 2010 GAMM co-organizer (jointly with Micheal Hintermüller) of the session on Mathematical Imaging, March 22-26, 2010, Karlsruhe, Germany
16. 2009 Summer School on “Theoretical Foundations and Numerical Methods for Sparse Recovery” held at the Johann Radon Institute for Computational and Applied Mathematics (RICAM), Linz - Austria, on August 31 - September 4, 2009 http://www.ricam.oeaw.ac.at/events/summerschool_2009/ (more than 70 confirmed students from 19 countries)
17. 2009 Member of the Technical Program Committee for the Int. Conf. “Signal Processing with Adaptive Sparse/Structured Representations” (SPARS2009), Apr. 7-10 2009, Saint-Malo, France
18. 2009 Special session “Sampling and (in)painting” at the Int. Conf. “Sampling Theory and Applications 2009” (SampTA 2009), Centre International de Rencontres Mathématiques (CIRM), May 28-22., 2009, Marseille-Luminy, France
19. 2008 Minisymposium “Compressive algorithms for applied inverse problems with sparse solutions”, IX SIMAI - Società Italiana di Matematica Applicata e Industriale - Conference, September 15-19, 2008, Rome, Italy
20. 2008 Thematic Programme “Applied Analysis and Fast Computation in Phase-Space”, September 2008, Wolfgang Pauli Institute, Vienna University, Austria
21. 2007 Workshop “PDEs and Variational Tools in Image Inpainting” June 11-12 2007, Wolfgang Pauli Institute, Vienna University, Austria

22. 2006 Mini-workshop “Sparsity and Applications”, June 21 2006, Johann Radon Institute for Computational and Applied Mathematics (RICAM), Austrian Academy of Sciences, Linz, Austria
23. 2006 Int. Conference “Recent Progress in Spline and Wavelet Approximation”, June 14-16 2006, Rome, Italy
24. 2004 Int. Conference “Classical and New Approximation Spaces: Theory and Applications”, Feb. 5-7 2004, Rome, Italy