Mladen Victor Wickerhauser

Curriculum Vitae

March 20, 2026

1 Professional Information

- *Regular Affiliation:* Professor of Mathematics, Washington University in St. Louis
- *Address:* Dept. of Mathematics, Campus Box 1146, Washington University, One Brookings Drive, St. Louis, MO 63130 USA, phone +1(314)935-6760, fax +1(314)935-6839.
- *Email:* `Victor@WUStL.Edu`
- *Education:*

  BS (Mathematics, with honor) 1980, California Institute of Technology, Pasadena, California.

  MS (Mathematics) 1982, Yale University, New Haven, Connecticut.

  PhD (Mathematics) 1985, Yale University.
- *Thesis Advisor:* Professor Ronald R. Coifman, Yale University.

2 Coauthors and Collaborators

K. Agyem, C. D'Alessandro, P. Andersen, J.M. Arbeit, P. Auscher, R. Bouguerra, R.R. Coifman, J. Corbett, E. Cubillo, W.K. Czaja, J.O. Deasy, X. Fang, M. Farge, N.L.B. Freeman, R.W. Fuhrhop B.K. Ghosh, E. Gootman, E. Goirand, F. Heurtaux, N. Hess-Nielsen, M.S. Hughes, A.R. Kahkoska, M. Kong, G.M. Lanza, J.-P. Leduc, F. Majid, J.N. Marsh, B. Maurizi, J.E. McCarthy, Y. Meyer, H.F. Mikkelsen, R. Muthukkumar, P.F. Odgaard, F. Pascal, A. Sankoh, T. Phillipovitch, M. Picard, F. Planchon, S. Quake, D. Rochberg, H. Šikić, J. Smith, J. Stoustrup, K.R. Sreenivasan, E. Theumann–Wesfreid, L. Thomas, A. Trgo, K. Ukrainčik, A. Vassiliou, E. Vidal, K.D. Wallace, R.S. Weinstock, G. Weiss, S.A. Wickline, W. Zhu, L. Zubair.

3 Patents

1. *Method and Apparatus for Encoding and Decoding Using Wavelet-Packets*, U.S. Patent No. 5,384,725 (with R. Coifman and Y. Meyer), issued 24 January 1995.
2. *Method and Apparatus for Encoding and Decoding Using Wavelet-Packets*, U.S. Patent No. 5,526,299 (with R. Coifman and Y. Meyer), issued 11 June 1996.
3. *A Method and Apparatus for Radiotherapy Treatment Planning*, U.S. Patent No. 6,792,073 (with Joseph O. Deasy), issued 14 September 2004.

4. *Fast Wavelet Estimation of Weak Bio-signals Using Novel Algorithms for Generating Multiple Additional Data Frames*, U.S. Patent No. 7,054,454 (with Elvir Causevic and Eldar Causevic), issued 30 May 2006.

5. *Fast Wavelet Estimation of Weak Bio-signals Using Novel Algorithms for Generating Multiple Additional Data Frames*, U.S. Patent No. 7,333,619 (with Elvir Causevic and Eldar Causevic), issued 19 February 2008.

6. *Applying Renyi Entropy to Detect Changes in Scattering Architecture*, U.S. Patent No. US8500644 B2 (with Michael S. Hughes, John McCarthy, Gregory Lanza, and Samuel Wickline), issued August 6th, 2013.

4 Editorships

- Associate Editor of the *International Journal on Wavelets and Multiresolution Processing* since 2002.
- Advisory Board member, Birkhäuser *Applied and Numerical Harmonic Analysis* book series since 1996.
- Associate Editor of the *Glasnik Matematički* since 1995.
- Associate Editor of the *Journal of Fourier Analysis and Applications* since 1994.
- Member of the Editorial Board of the *SIAM Journal on Mathematical Analysis*, 1993–1997.
- Software Editor; Member of the Editorial Advisory Board of the *Journal of Applied and Computational Harmonic Analysis* since 1993.

5 Computer Programs

1. Contributions to `CADAM` computer-aided design program (FORTRAN and mainframe assembler language), 1979–80.

2. `Qube` educational program to display 4-dimensional polytopes (Pascal), 1988, available from various PC bulletin boards.

3. `Wavelet Packet Library v1` programs (C, for various computers), 1989–92, available from `pascal.math.yale.edu` by anonymous FTP.

4. `WPLab` programs (Objective-C, for the NeXT), 1991-92 (with David Rochberg), available from `wuarchive.wustl.edu` in by anonymous FTP.

5. `WPL v1.06` (Standard C, for DOS), 1991, (with Krešimir Ukrainčik and Aaron Fand), available from Digital Diagnostics Corporation, 1020 Sherman Avenue, Hamden, Connecticut, 06514.

6. `Adapted Waveform Analysis Library, v2.0` (Standard C, for Unix and VMS), June, 1992. Available from FMA&H Corporation, 1020 Sherman Avenue, Hamden, Connecticut, 06514.

7. `XWPL` (Standard C, for X-Windows), 1993, (with Fazal Majid), available from `math.yale.edu` by anonymous FTP.

8. `WPLW` (Standard C, for Windows), (with Krešimir Ukrainčik), ISBN 1-56881-036-9, published in 1994 by A. K. Peters, Ltd., 289 Linden Street, Wellesley, MA, 02181.

9. `Graphical Work Station` (C++, for Windows), (with Krešimir Ukrainčik), 1994, Simulation software for adapted scanning LCD displays.

10. `wsq0` and `iwsq0` (Standard C), 1995, conforming implementation of the FBI's WSQ fingerprint image compression algorithm.

11. `Adapted Waveform Analysis Library, v3.0` (Standard C, for Unix). June, 1995. Available from FMA&H Corporation, 1020 Sherman Avenue, Hamden, Connecticut, 06514.

12. `wsq1` and `iwsq` (Standard C), October, 1998, WSQ fingerprint image codec with FBI Encoder 1, compliant to IAFIS-IC-0110v2, 16 Feb 1993. Versions for ten HW/OS/CC combinations.

13. `wsq2` and `iwsq` (Standard C), June, 2011, WSQ fingerprint image codec with FBI Encoder 1 and 2, compliant to IAFIS-IC-0110(v3.1), 4 Oct 2010. Versions for two HW/OS/CC combinations.

6 Awards, Contracts, Fellowships, and Grants

- Grant DACA-64620, "Laser Doppler Vibrometry Signal Processing," (PI John Rohrbaugh), June, 2007.

- Wavelet Pioneer Award, Society of Photo-Optical Instrumentation Engineers, 4 April 2002.

- Grant DMS-0072234, "Adapted Wavelet Algorithms," National Science Foundation, 1 July 2000 to 30 June 2004.

- Grant MRI-9977670, "Acquisition of a Parallel Computer for Research and Research Training in Science" (with Wai-Mo Suen, Claude Bernard, Barbara Pickard, and Michael Wysession), National Science Foundation, 1 September 1999 to 31 August 2002.

- Grant F49620-99-1-0068, "Spatio-Temporal Wavelets for Motion Detection and Target Tracking" (with Jean-Pierre Leduc), Air Force Office of Scientific Research, 1 December 1998 to 30 November 2000.

- Grant DMS-9631359, "Research and Training in Computational Harmonic Analysis" (with Richard H. Rochberg, Albert Baernstein II, Steven G. Krantz, John McCarthy, Mitchell H. Taibleson and Guido L. Weiss), National Science Foundation, 1 September 1996 to 31 August 1999.

- Grant DMS-9531967, "Mathematical Sciences: Research Group in Analysis" (with Richard H. Rochberg, Steven G. Krantz, Guido L. Weiss, Mitchell H. Taibleson and John McCarthy), National Science Foundation, 1 August 1996 to 31 July 2001.

- Grant F49620-96-1-0287, "Stable Feature Classification in the Wavelet Domain" (with Guido L. Weiss), Air Force Office of Scientific Research, 1 June 1996 to 31 December 1998.

- Grant F49620-95-1-0231, "Feature Extraction by Best-Basis and Wavelet Methods," (with Ronald R. Coifman and Guido L. Weiss), Air Force Office of Scientific Research, 1 March 1995 to 29 Feb 1996.

- Grant DMS-9302828, "Research Group in Harmonic Analysis," (with Richard Rochberg, Mitchell Taibleson and Guido L. Weiss), National Science Foundation, 1 July 1993 to 31 December 1995.

- Grant CRG-930456, "Collaborative Research in Turbulence" (with Marie Farge and Peter Frick), North Atlantic Treaty Organization, 1 April 1993 to 31 December 1995.
- Grant to support "Research Group in Wavelet Analysis and Applications," (with Guido L. Weiss and members of the School of Engineering), Southwestern Bell Telephone Company, 1993–96.
- Grant F49620-92-J-0106 (continuation) "Feature Extraction by Best-Basis and Wavelet Methods" (with Ronald R. Coifman), Air Force Office of Scientific Research, 15 January 1993 to 14 May 1994.
- Grant F49620-92-J-0106, "Feature Extraction by Best-basis Wavelet Methods" (with Guido L. Weiss), Air Force Office of Scientific Research, 15 January 1992 to 14 January 1993.
- Contract A107183, "Evaluation of Fingerprint Image Compression Algorithms," Federal Bureau of Investigation, August, 1991.
- Membership, Mathematical Sciences Research Institute, Berkeley, California, Winter, 1988.
- Grant DMS-8611352, "Conference in Harmonic Analysis," (with John A. Gosselin), National Science Foundation, March, 1987.
- Faculty Research Grant, "Inverse Scattering and Partial Differential Equations," University of Georgia Research Foundation, 1986.
- University Fellowship, Yale University, 1980–1984.
- Richter Fellowship in Mathematics, California Institute of Technology, 1978.

7 Invited Lectures

1. *A Real-Variable Approach to Complex Analysis.* Seminar, Oberlin College, Ohio, March 1985.
2. *Inverse Scattering and the Kadomtsev–Petviashvili Equation.* Seminar, Ohio State University, Columbus, March 1985.
3. *Inverse Scattering Theory and the Kadomtsev–Petviashvili Equation.* Seminar, Ohio University, Athens, March 1985.
4. *Inverse Scattering and the Kadomtsev–Petviashvili Equation.* Seminar, University of Georgia, Athens, April 1985.
5. *Inverse Scattering and Evolution Equations.* Lecture, Auburn University, Alabama, November 1985.
6. *Evolution Equations of Kadomtsev–Petviashvili Type.* Seminar, Université de Montréal, May 1986.
7. *A Functional Calculus for Operators.* Seminar, University of Missouri at Saint Louis, April 1987.
8. *The $\bar{\partial}$ method of inverse scattering.* Seminar, Washington University, Saint Louis, Missouri, April 1987.
9. *Elementary Tensor Wavelets.* Seminar, Mathematical Sciences Research Institute, Berkeley, California, January 1988.
10. *Some Problems from the Theory of Inverse Scattering.* Seminar, Mathematical Sciences Research Institute, Berkeley, California, February 1988.

11. *Hamiltonian Form for the KP Equation.* Dixieland Analysis Seminar, Emory University, Atlanta, Georgia, November 1988.

12. *Fast Application of Singular Integral Operators.* Seminar, Daniel H. Wagner Associates, Vienna, Virginia, April 1989.

13. *Fast Application of Singular Integral Operators.* Seminar, Center for Naval Analyses, Alexandria, Virginia, May 1989.

14. *Scattering theory for the Benjamin–Ono equation.* Lecture, International conference on harmonic analysis organized by Andrzej Hulanicki, Tuczno, Poland, June 1989.

15. *Scattering Theory for the Benjamin–Ono Equation.* Seminar, Yale University, New Haven, Connecticut, October 1989.

16. *Acoustic Signal Compression with Adaptive Wave-Packet Bases.* Seminar, AT&T Bell Laboratories, Murray Hill, New Jersey, November 1989.

17. *Scattering Theory for the Benjamin–Ono Spectral Problem.* Seminar, Clarkson University, Potsdam, New York, November 1989.

18. *The Scattering Transform for the Benjamin–Ono Equation.* Lecture, Joint NSF-ONR Summer Research Conference on Inverse Scattering and its Applications, University of Massachusetts, Amherst, June 1990.

19. *Acoustic Signal Compression with Wavelet Packets.* Lecture, Mini-symposium on Applications of Wavelets to Signal Processing, SIAM annual meeting, Chicago, Illinois, July 1990.

20. *Best-Adapted Bases in Signal Processing and Analysis.* Colloquium, Washington University, Saint Louis, Missouri, October 1990.

21. *Three Lectures on Signal Processing with Wavelet Packets.* Lecture, Workshop on wavelets and signal processing, CNRS, Marseilles, France, November 1990.

22. *Signal Processing and Compression with Wavelet Packets.* Seminar, Schlumberger-Doll Research, Ridgefield, Connecticut, November 1990.

23. *New Methods in Inverse Scattering.* Seminar, Pennsylvania State University, State College, February 1991.

24. *A Comparison of Scanned Fingerprint Image Compression Algorithms.* Seminar, Federal Bureau of Investigation, Washington, D.C., March 1991.

25. *Wavelet Packet Algorithms and Applications.* Seminar, Wright-Patterson Air Force Base, Dayton, Ohio, March 1991.

26. *Signal Compression and Restoration.* Seminar, Groupe Digitone, Aix-en-Provençe, France, May 1991.

27. *Short Course on Wavelet Packet Methods in Signal Processing and Analysis.* écoles CEA–EDF–INRIA, Roquencourt, France, June, 1991.

28. *The Fast Approximate Karhunen–Loève Transform.* Lecture, Wavelets and Numerical Algorithms Mini-symposium, International Conference on Industrial and Applied Mathematics, Washington, D.C., July 1991.

29. *Adapted Waveform Algorithms in Computational Physics.* Colloquium, Department of Physics, Washington University in Saint Louis, October 2 1991.

30. *Wavelet Packet Algorithms and their Implementations.* Four hour tutorial, Martin–Marietta Missile Systems, Orlando, Florida, October 21–25 1991.

31. *Fast Approximate Factor Analysis.* Conference on Intelligent Robotic Systems, International Society for Optical Engineering (SPIE), Boston, Massachusetts, 12 November 1991.

32. *Adapted Waveform Analysis and Signal Processing.* Mathematics Colloquium, Reed College, Portland, Oregon, 8 December 1991.

33. *Adapted Waveform Analysis and Signal Processing.* Seminar on Wavelets–Theory and Applications, Danmarks Tekniske Højskole, Copenhagen, 17 January 1992.

34. *Fast Approximate Factor Analysis.* Seminaire d'Analyse Harmonique, Orsay—Université Paris–Sud, France, 3 February 1992.

35. *Wavelets and Computed Two-Dimensional Turbulence.* Seminar, Program in Applied Mathematics, University of Colorado at Boulder, 5 March 1992.

36. *Adapted Waveform Analysis: the Practical Applications of Atomic Decompositions.* Lecture, Shanks Lectures Symposium on Wavelet Theory, Vanderbilt University, Nashville, Tennessee, 4 April 1992.

37. *Wavelets in Signal Processing and Computation.* Colloquium, Department of Physics, University of Missouri, Columbia, 21 April 1992.

38. *Wavelets and Adapted Bases in Signal Processing and Analysis.* Seminar, Center for Applied Mathematics, Notre Dame University, South Bend, Indiana, 23 April 1992.

39. *Short Course on Adapted Bases in Signal Processing and Analysis.* Sino-French Conference on Wavelets and Applications, Wuhan University, China, 22,23,25 May 1992.

40. *Periodic Wavelets and Wavelet Packets,* and *Fast Wavelet Algorithms in Numerical Analysis.* Institute of Mathematics, Academia Sinica, Beijing, China, 3 June 1992.

41. *Computation with Adapted Time-Frequency Atoms.* Lecture, International Conference on Wavelets and Applications, Toulouse, France, 11 June 1992.

42. *Fast Approximate Factor Analysis and Inverse Problems: Preliminary,* lecture, 10th Annual Joint Summer Research Conference on Wavelets and Applications, Mt. Holyoke College, Massachusetts, 30 June 1992.

43. *Fast Principal Components Via Wavelet Packets.* Lecture, Institute of Mathematical Statistics, 55th annual meeting and workshop on new wavelet-type constructions and applications, Boston, Massachusetts, 12 August 1992.

44. *Wavelet Methods in Computational Turbulence.* Lecture, NATO Advanced Study Institute on Wavelets and Their Applications, Il Ciocco Resort, Barga, Italy, 16–29 August 1992.

45. *Computations with Adapted Time-Frequency Atoms I,II.* Lecture, Ninth Auburn Mini-conference on Harmonic Analysis and Related Areas, Auburn University, Alabama, 4–5 December 1992.

46. *Best-adapted Wavelet Packet Bases.* American Mathematical Society Short Course on Wavelets and Applications, San Antonio, Texas, 12 January 1993.

47. *Wavelets and Data Compression.* Five hour short course, Wavelets Down Under, Adelaide, South Australia, 21 January 1993.

48. *Smooth Localized Orthonormal Bases and De-noising.* Mcquarie University Analysis Seminar, Sydney, Australia, 27 January 1993.

49. *Orthonormal Bases of Compactly Supported Functions.* Seminar, University of Georgia, Athens, Georgia, 30 April 1993.

50. *The Adapted Waveform Functional Calculus.* Seminar, University of North Carolina, Charlotte, North Carolina, 2 May 1993.

51. *Ondelettes, Compression et Débruitage.* Séminaire Ondelettes—Développements Nouveaux, Institut d'Expertise et de Prospective de l'Ecole Normale Superieure, Hôtel Lutétia, Paris, France, 15 June 1993.

52. *Ondelettes, Compression et Débruitage pour le Traitement du Signal.* Lecture, Journées état de l'art au CESTA, CEA/CESTA Bordeaux, France, 18 June 1993.

53. *Some Applications of the Wavelet Functional Calculus to Potential Theory and Chemical Engineering.* Lecture, Math-Chem-Comp '93, Rovinj, Croatia, 25 June 1993.

54. *Wavelets and Models of Turbulence.* International Colloquium in Honor of Jean-Pierre Kahane, Université Paris-Sud, Orsay, France, 30 June 1993.

55. *Fast Approximate Factor Analysis and the Inversion of Complicated Maps.* Seminar, Groupe du Travail Ondelettes, CNRS/CPT Luminy, France, 6 July 1993.

56. *Advanced Topics in Wavelets and Adapted Waveform Analysis.* Five hour tutorial, Martin–Marietta Technologies, Inc., Orlando, Florida, 4–6 October 1993.

57. *Wavelets, Adapted Waveforms, and De-noising.* Lecture, Frontier Science in EEG Symposium: Continuous Waveform Analysis, New Orleans, Louisiana, 9 October 1993.

58. *Wavelet Packets for Signal Compression and Computations.* Lecture, International Conference on Wavelets Theory, Algorithms and Applications, Taormina, Sicily, 15 October 1993

59. *Wavelets, Signal Compression and De-noising.* Electronic Systems and Signals Research Laboratory Seminar, School of Engineering and Applied Science, Washington University in Saint Louis, 3 November 1993

60. *Wavelet Packets for Signal Compression and Computations.* Colloquium, Department of Mathematics, University of Kentucky, Lexington, 9 December 1993

61. *Wavelet Approximations to Jacobians and the Inversion of Complicated Maps.* Colloquium, Department of Mathematics, University of Pittsburgh, Pennsylvania 10 December 1993

62. *The Adapted Waveform Functional Calculus.* Mini-symposium lecture, Cornelius Lanczos Centenary, North Carolina State University, Raleigh, 13 December 1993

63. *Smooth Localized Orthonormal Bases.* Lecture, Special Session on Wavelets, AMS Annual Meeting, Cincinnati, Ohio, 13 January 1994

64. *Adapted Waveform Analysis for Compression, Feature Recognition and De-noising.* Ieee and EE Department Seminar, University of Missouri at Rolla, 15 March 1994

65. *Smooth Localized Orthonormal Bases.* Lecture, Session on Wavelets and Applications, NARCE Sixth Annual Conference, Atlanta, Georgia, 18 March 1994

66. *Adapted Wavelet Algorithms.* Colloquium, Department of Mathematics, University of Florida, Gainesville, 4 April 1994

67. *Wavelet Approximations to Jacobians and the Inversion of Complicated Maps.* Lecture, Session on Wavelet Applications, SPIE Meeting on Intelligent Information Systems, Orlando, Florida, 5 April 1994

68. *Smooth Localized Orthonormal Bases.* Analysis Seminar, Cornell University Department of Mathematics, Ithaca, New York, 25 April 1994

69. *Extraction of Vortices from Two-Dimensional Decaying Turbulence Simulations: A Model for Feature Recognition in Computed and Measured Fluid Dynamics.* Lecture, Math-Chem-Comp 1994, Dubrovnik, Croatia, 26 June 1994

70. *The Application of Adapted Wavelet Transforms to Signal Analysis and Computation in Chemical Applications.* Three hour mini-course, Math-Chem-Comp 1994, Dubrovnik, Croatia, 27-30 June 1994

71. *Smooth Localized Orthonormal Bases.* Analysis Seminar, Prirodoslovni i Matematički Fakultet, University of Zagreb, Croatia, 5 July 1994

72. *Time Localization Techniques for Wavelet Transforms.* Lecture, SPIE Annual Meeting, San Diego, California, 29 June 1994

73. *Adapted Wavelet Transforms for Signal Analysis and Computation.* Five hour mini-course, University of Madeira, Funchal, 8–10 August 1994

74. *"WPLab 3.02".* Software demonstration, Geometry Center, University of Minnesota, Minneapolis, 19 October 1994

75. *Comparison of Picture Compression Methods: Wavelet, Wavelet Packet, and Local Cosine Transform Coding.* Lecture, Conference on Wavelets and Large-Scale Image Processing, Argonne National Laboratory, Illinois, 22 October 1994

76. *Large-rank Approximate Principal Component Analysis with Wavelets for Signal Feature Discrimination and the Inversion of Complicated Maps.* SFB Differential Geometry and Quantum Physics Seminar, Technische Universität, Berlin, Germany, 19 January 1995

77. *Adapted Wavelet Algorithms for Feature Recognition and De-Noising.* Two hour lecture plus three hour software tutorial, Wavelets Down Under II, Melbourne University, Australia, 3 February 1995

78. *Multiplication of Short Wavelet Series Using Connection Coefficients.* Lecture, AMS Regional Meeting No. 900, De Paul University, Chicago, Illinois, 25 March 1995

79. *Adapted Wavelet De-noising of Echo-Planar MRIs.* Lecture, Washington University Biological and Biomedical Engineering Workshop, St. Louis, Missouri, 16 May 1995

80. *Multiplication of Short Wavelet Series Using Connection Coefficients.* Applied Mathematics Seminar, Stanford University, 19 May 1995

81. *The Best Basis Algorithm and Entropy.* Colloquium, Macquarie University, North Ryde, New South Wales, Australia, 13 June 1995

82. *Designing a transform coding image compression algorithm: the FBI and electronic fingerprint storage.* Colloquium, CSIRO, North Ryde, New South Wales, Australia, 14 June 1995

83. *Multiplication of Short Wavelet Series Using Connection Coefficients.* Analysis seminar, Macquarie University, New South Wales, Australia, 15 June 1995

84. *Adapted Wavelet Basis.* Seminar, Cooperative Research Center for Sensor Signals and Information Processing (CSSIP), Adelaide, South Australia, 23 June 1995

85. *Adapted Wavelet Analysis and Signal Processing.* Six 90-minute lectures, Universitá di Messina, 7–14 July 1995

86. *A Relation Between Shannon–Weaver Entropy and "Theoretical Dimension" for Smooth Classes of Functions.* Seminari di Analisi Matematica, Politecnico di Milano, Italy, 18 July 1995

87. *Multiplication of Short Wavelet Series Using Connection Coefficients.* Seminar, CNRS Laboratoire de Météorologie Dynamique, École Normale Supérieure, Paris, France, 20 July 1995

88. *A Relation Between Shannon–Weaver Entropy and "Theoretical Dimension" for Smooth Classes of Functions.* Seminar, Deutsche Telekom Wavelet Compression Workshop, Technische Universität Berlin, Germany, 4 August 1995

89. *Wavelet Compression for Still Images.* Seminar, Wavelets (Signalverarbeitung) workshop, Oberwolfach, Germany, 7 August 1995

90. *Adapted Wavelet De-noising for Medical Signals and Images.* Lecture, Workshop on New Advances in Biomedical Signal and Image Processing, Time-Frequency, Wavelets, Wavelet Packets in Biomedical Engineering. 17th Annual International Conference of IEEE/EMBS. Montréal, Quebec. 19 September 1995.

91. *Multidimensional Wavelets and Adapted Waveforms, Time-Frequency Features, and Image Compression.* Four hour tutorial, Advanced Seminar in Wavelets and Adapted Waveform Analysis, Martin Marietta Technologies, Inc., Orlando, Florida, 9 November 1995.

92. *Wavelets for Signal Processing and Compression.* Lecture, JASON Fall Meeting, McLean, Virgina, 18 November 1995.

93. *Wavelets for Compression, De-Noising, and Feature Discrimination.* Lecture, Pavilion Technologies Inc., Austin, Texas, 6 December 1995.

94. *Wavelet Applications to Image Compression, Feature Detection, and De-Noising.* JASON Wavelet Workshop, San Diego, California, 17 January 1996.

95. *Adapted Wavelet Transforms for Image Compression.* Lecture, Workshop on Error-Resilient Image and Video Compression, NRaD, San Diego, California, 14 February 1996.

96. *Adapted Wavelet Transforms for Signal Analysis and Computation.* Lecture, Battelle Memorial Institute, Pacific Northwest National Laboratory, Richland, Washington, 28 February 1996.

97. *Theoretical Dimension and the Complexity of Simulated Turbulence.* Lecture, Program on Spline Functions and the Theory of Wavelets, Centre de Recherches Mathématiques, Université de Montréal, Quebec, 8 March 1996.

98. *Theoretical Dimension and the Complexity of Simulated Turbulence.* Plenary lecture, Conference on Harmonic Analysis and Wavelet Analysis, Peking University, 10 June 1996.

99. *A Survey of Adapted Wavelet Algorithms.* Three hour mini-course, Conference on Harmonic Analysis and Wavelet Analysis, Institute of Mathematics, Academia Sinica, Beijing, China, 11&13 June 1996.

100. *Wavelet Image Compression.* Seminar, Department of Mathematics, Chongqing University, China, 16 June 1996.

101. *The Fingerprint Compression Algorithm* and *Time-Frequency Analysis of Chirps.* Seminars at the Institute of Mathematics, Academia Sinica, Beijing, China, 22 June 1996.

102. *Tutorial on Wavelet Theory.* Four hour mini-course, Litton Applied Technology, San Jose, California, 9 July 1996.

103. *Wavelets in Pure and Applied Mathematics.* Invited lecture, First Croatian Mathematics Congress, Zagreb, Croatia, 20 July 1996.

104. *Tutorial on Wavelet Theory.* Six hour mini-course, Amoco Tulsa Technology Center, Tulsa, Oklahoma, 12 August 1996.

105. *Custom Wavelet Packet Image Compression for Multimedia.* Colloquium, Department of Mathematics, Missouri University, Columbia, 18 September 1996.

106. *Wavelet Packets and 2D Turbulence.* Seminar, Workshop on Statistics and Dynamics of Vortices in Geophysical Flows, Isaac Newton Institute, Cambridge, England, 31 October 1996.

107. *Adapted Wavelet De-Noising in 1-D and 2-D* . SIGPROC seminar, Department of Engineering, Cambridge University, England, 31 October 1996.

108. *Custom Wavelet Packet Image Compression for Multimedia.* Two hour mini-course, Broadband and Multimedia Workshop, FER, University of Zagreb, Croatia, 11 November 1996.

109. *Information Cost Functions.* Colloquium, Department of Mathematics, University of Zagreb, Croatia, 13 November 1996.

110. *Information Cost Functions and Data Compression.* Colloquium, Department of Mathematics, University of Missouri in St. Louis, 6 February 1997.

111. *Fonctions Coût d'Information.* Seminar, CEREMADE, University of Paris–Dauphine, 3 March 1997.

112. *Tutorial on Wavelet Theory.* Six hour mini-course, Amoco Mid Continent Business Unit, Denver, Colorado, 10 March 1997.

113. *Custom Wavelet Packet Image Compression Design.* Seminar, Multi-wavelets: Theory and Applications Conference, Sam Houston State University, Huntsville, Texas, 21 March 1997.

114. *Information Cost Functions and Data Compression.* Colloquium, Department of Statistics, University of Missouri, Columbia, 1 April 1997.

115. *A Survey of Adapted Wavelet Algorithms* and *Comparison of Wavelet Image Coding Schemes for Seismic Data Compression.* Seminars, Workshop on Wavelets and Their Applications, Institute of Mathematical Sciences, Chinese University of Hong Kong, 5–8 May 1997.

116. *Signal Processing and Compression with Wavelet Packets.* Seminar, and *Designing a Custom Wavelet Packet Image Compression Algorithm.* Tutorial, Inter-Faculty Industrial Seminar, Wavelets Strategic Research Programme, National University of Singapore, 13 May 1997.

117. *Compression Methods and Feature Extraction in Turbulence.* Tutorial, Summer School, New Interactions: Wavelets, Signal Analysis, Simulations and Probabilistic Models, Marseille-Luminy, 21 July 1997.

118. *Wavelet Packet Data Analysis.* Conference lecture, Perspectives in Mathematical Physics: Conference in Honor of Alex Grossmann, Marseille-Luminy, 1 August 1997.

119. *Discrete Wavelet Analysis.* Five hour mini-course, Functional Analysis V, Inter-University Center, Dubrovnik, 23-26 September 1997.

120. *Wavelets, Decreasing Rearrangements, and Feature Detection.* Conference lecture, AMS Meeting 927, "Analysis with Wavelets IV," University of Wisconsin at Milwaukee, 25 October 1997.

121. *Custom Wavelet Packet Image Compression Design.* Conference lecture, Fourth Biennial Wavelet Workshop, Lockheed Martin Corporation, Orlando, Florida, 9 February 1998.

122. *Wavelet Algorithms for Industrial Applications.* Two conference lectures, International Wavelet Conference, Tangier, Morocco, 13–17 April 1998.

123. *Rational Design of Image Compression Algorithms.* Colloquium, Illinois State University, 28 April 1998.

124. *Wavelets Rippling Across Image Analysis.* Mathematics Awareness Week Lecture, Illinois State University, 28 April 1998.

125. *Rational Design of Image Compression Algorithms.* Colloquium, University of Maryland, 1 May 1998.

126. *Rational Design of Image Compression Algorithms.* Invited conference lecture, NSF-CBMS Wavelet Conference, University of Central Florida, Orlando, 4 May 1998.

127. *Custom Data Compression for Very Large Data Sets.* Seminar, Workgroup in Mathematical Physics and Differential Equations, Technical University of Berlin, 18 May 1998.

128. *Wavelet Analysis and Applications.* Seminar, Aarhus University, Denmark, 27 May 1998.

129. *Rational Design of Image Compression Algorithms.* Invited conference lecture, Danish Symposium on Partial Differential Equations; analysis and applications, Odense University, 28 May 1998.

130. *Wavelet Algorithms and Applications.* Two-day tutorial, WIS Technologies, Inc., San Jose, California, 22–23 January 1999.

131. *Information Cost Functions.* Invited conference lecture, AMS Sectional Meeting 941, University of Illinois at Urbana-Champaign, 18-21 March 1999.

132. *Wavelet Packets and Custom Compression Algorithms.* Six hour tutorial, National Taiwan Normal University, Taipei, 13–14–20 July 1999.

133. *Information Cost Functions.* Invited seminar, National Taiwan Normal University, 20 July 1999.

134. *Fast Approximate Karhunen–Loève Transforms.* Invited seminar, National Taiwan Normal University, 20 July 1999.

135. *Symmetric Wavelet Transforms.* Invited seminar, National Taiwan Normal University, 22 July 1999.

136. *Efficient Machine Computation of Wavelet Transforms.* Invited seminar, National Taiwan Normal University, 22 July 1999.

137. *A Survey of the Basis and Frequency Localization Properties of Wavelet Packets.* Invited lecture, Functional Analysis VI, Dubrovnik, Croatia, 21 September 1999.

138. *Almost Everywhere Convergence of Wavelet Packets.* Invited lecture, Zhongshan University, Guangzhou, China, 16 November 1999.

139. *New wavelet algorithms to solve old problems.* Invited lecture, CBMS Regional Conference at U Missouri at St. Louis, 24 May 2000.

140. *Wavelet postprocessing for otoacoustic emission detection and radiation dose planning.* Invited lecture, IEEE EMBS Workshop, Chicago, 22 July 2000.

141. *Wavelet packets and custom compression algorithms.* Colloquium, U Palermo, 29 September 2000.

142. *Applications of adapted wavelet transforms to image processing.* Invited lecture, 11th ECMI Workshop, Palermo, 30 September 2000.

143. *Wavelet postprocessing for weak biosignal detection and radiation dose planning.* Plenary lecture, International Conference on Computational Harmonic Analysis, City University of Hong Kong, 8 June 2001.

144. *Singularity Detection in Images Using Dual Local Autocovariance.* Keynote lecture, Second International Conference on Wavelet Analysis and Its Applications (WAA 2001), Hong Kong Baptist University, 20 December 2001.

145. *Applications of Wavlets in Image Analysis.* Introductory talk, Mathematical Challenges in Scientific Data Mining, IPAM, UCLA, January 16, 2002.

146. *Wavlet Denoising of Radiation Dose Distributions, and Singularity Detection in Images.* Applied Mathematics Seminar, Department of Mathematics, Yale University, New Haven, 23 April 2002.

147. *Singularity Detection in Images Using Dual Local Autocovariance.* Conference lecture, Workshop on Wavelets, Aalborg University, 15 August 2002.

148. *Some Theory, but More Applications of Wavelet Packets.* Keynote lecture, Conference on Applied Mathematics, University of Central Oklahoma, Edmond, 25 October 2002.

149. *Singularity Detection in Images Using Dual Local Autocovariance.* Invited lecture, Conference on Applied Mathematics – Wavelet Analysis Session, University of Central Oklahoma, Edmond, 27 October 2002.

150. *Accelerating Convergence of Monte Carlo Approximation of Radiation Dose Distributions by Wavelet Threshold De-Noising.* Invited seminar, National Taiwan Normal University, 11 December 2002.

151. *Mathematics for Multimedia.* Tutorial in four lectures, National Taiwan Normal University, 16–17 December 2002.

152. *Singularity Detection in Images Using Dual Local Autocovariance.* Eberly College Distinguished Lecture in Mathematics, West Virginia University, 6 March 2003.

153. *Constructing Nonlinear Edge Detectors Using Fourier Moments.* Colloquium, Wichita State University, 10 March 2004.

154. *Constructing Nonlinear Edge Detectors Using Fourier Moments.* Tutorial in six lectures, Zhejiang University, Hangzhou, China, 19–27 May 2004.

155. *Adapted Waveform Algorithms and Image Processing.* Invited conference lecture, Ningbo University, Ningbo, China, 22 May 2004.

156. *Two Simple Nonlinear Edge Detectors.* Keynote lecture, Logistical Engineering University, Chongqing, China, 28 May 2004.

157. *Processing Weak Biosignals.* Invited conference lecture, Workshop on Modern Methods of Time-Frequency Analysis, Strobl, Austria, 27 May 2005.

158. *Undecimated and Translation-Invariant Wavelet Transform De-Noising.* Invited conference lecture, Conference on Wavelets and Frames, Tuhelj, Croatia, 1 June 2005.

159. *Wavelet Filter Transforms in Detail.* Colloquium, Norbert Wiener Center, University of Maryland, 22 February 2008.

160. *Wavelets, Sparse Representations, and Denoising.* Colloquium, University of Zagreb, 25 February 2009.

161. *Discrete Wavelet Transforms in Practice.* Seminar, University of Zagreb, 3 March 2009.

162. *Discrete Wavelet Transforms in Practice.* Invited lecture, SPIE Conference 7343-02, Orlando, Florida, 13 April 2009.

163. *1. Using Wavelet Transforms for Image and Signal Analysis, and 2. Some Applications of Wavelets to Medical Image Analysis.* Special Workshop Lecture, Workshop on Biomedical Image Analysis Algorithms, Summer Time Frequency Talks 2009, National Institutes of Health, Bethesda, Maryland, 20 August 2009.

164. *Wavelets in Image Compression.* Invited lecture, THEORY AND APPLICATIONS OF WAVELETS: A Workshop Honoring Ingrid Daubechies, Villanova University, Pennsylvania, 28 April 2011.

165. *The Pigeonhole Principle.* Math Circles presentation, Washington University, St. Louis, 22 September 2013.

166. *Error Correcting Codes.* Math Circles presentation, Washington University, St. Louis, 20 September 2015.

167. *Superposition and Orthogonality.* Mu Alpha Theta National Convention presentation, Washington University, St. Louis, 12 July 2016.

168. *Pigeons and Rams(ey).* Math Circles presentation, Washington University, St. Louis, 2 October 2016.

169. *A Run Through Some Fields.* Math Circles presentation, Washington University, St. Louis, 8 October 2017.

170. *Euclid and Fibonacci.* Math Circles presentation, Washington University, St. Louis, 24 February 2019.

171. *Arbitrage and Convexity in Discrete Financial Models.* Faraway Fourier Talks, Norbert Wiener Center, University of Maryland, 11 January 2021.

172. *Error Correcting Codes.* Math Circles presentation, Washington University, St. Louis, 14 February 2021.

173. *Arbitrage and Convexity in Discrete Financial Models.* Colloquium, PMF-MO, University of Zagreb, 16 February 2022.

174. *Superposition and Orthogonality from Polynomials to Wavelets.* PhD Symposium, PMF-MO, University of Zagreb, 22-24 April 2022.

175. *Arbitrage and Convexity in Discrete Financial Models.* Math Club presentation, Washington University in St. Louis, 18 March 2024.

8 Teaching

- *External Undergraduate Interns.*
  - Frédéric Heurtaux, École Polytechnique, 13 April to 31 July 1992.
  - Fabrice Planchon, École Polytechnique, 13 April to 31 July 1992.
  - Vincent Bouatou, École Polytechnique, 12 April to 6 July 1999.
  - Mathieu Picard, École Polytechnique, 6 April to 7 July 2000.
  - Nicolas Kauffmann, École Polytechnique, 8 April to 26 June 2002.
  - Jean Herbiére, École Polytechnique, 7 April to 15 July 2003.
- *External Postgraduate Interns.*
  - Eric Goirand, Université de Paris VI, 1 January 1993 to 30 April 1994.
  - Peter Fogh Odgaard, Aalborg University, 1 March to 30 June 2003.
- *Washington University Courses.*
  - Programming in C (Math 1201) S'97(11), F'97(14), F'99(14).
  - Calculus I (Math 131) F'95(80).
  - Calculus II (Math 132) S'15(168).
  - Accelerated Calculus I-II for Engineers (Math 141-142) F'93(53), S'94(42).
  - Differential Equations (Math 217) S'93(26), F'21(75), F'22(51), F'23(59), F'25(121).
  - Calculus III (Math 233) S'96(110), S'05(95), F'18(85).
  - Matrix Algebra (Math 309) S'03(29), F'20(50).
  - Foundations for Higher Mathematics (Math 310) F'02(10).

- Biostatistics (Math 322) S'05(8), S'06(11), S'07(8), S'08(9), S'10(12), S'11(13), S'12(22), S'13(25), S'14(29), S'15(31), S'16(33), S'17(49), S'18(55), S'20(33), S'21(43), S'24(39).
- Topics in Applied Mathematics: Mathematics for Multimedia (Math 350) F'97(4), F'99(6), F'01(6), S'04(4).
- Dynamical Systems (Math 3520) S'26(21)
- Undergraduate Independent Study (Math 400) F'10(1), S'10(1), S'12(1), F'13(1), F'14(1), S'15(1), S'18(1), F'18(1), S'24(1), F'25(2).
- Numerical Methods (Math 404) S'97(5), S'99(4), S'00(6), S'03(7), S'04(2).
- Computational Mathematics (Math 405)
- Fourier Series and Integrals (Math 410) F'17(3).
- Advanced Calculus I (Math 411) F'94(21), F'00(28), F'01(24).
- Introduction to Analysis (Math 4111) F'12(41).
- Advanced Calculus II (Math 412) S'95(6), S'01(15).
- Lebesgue Integration (Math 4121=4102) S'13(26),S'26(40).
- Complex Variables (Math 416) F'05(2).
- Numerical Methods (Math 449) F'05(4), F'07(17), F'08(18), F'09(22), F'10(24), F'11(20), F'13(33), F'16(44), F'18(39), F'19(41).
- Topics in Applied Mathematics: Mathematics for Multimedia (Math 450) S'06(3), S'08(15), S'10(18), S'11(18), S'12(16), S'14(18), S'17(37), S'19(20), S'23(14).
- Topics in Financial Mathematics (Math 456=4560) F'19(38), F'20(27), F'21(29), F'22(44), F'23(63), F'24(71), F'25(75).
- Stochastic Processes (Math 495) S'18(25).
- Study for Honors (Math 499) F'10(1), F'17(1), S'18(1), F'18(1), S'19(1), S'19(1), F'20(1), S'21(1), F'22(1), S'23(2).
- Independent Work (Math 500) F'04(2), S'05(1), S'08(1), F'10(1), F'11(1), S'12(1), F'12(2), S'13(2), F'13(1), S'14(1), F'19(1), S'23(1), F'23(1), S'24(1).
- Statistics Practicum (Math 502) F'22(1), S'23(1).
- Measure Theory and Functional Analysis I (Math 5051) F'06(7), F'15(12).
- Measure Theory and Functional Analysis II (Math 5052) S'07(4), S'16(6).
- Harmonic Analysis (Math 519) F'98(7).
- Topics in Applied Mathematics: Wavelet Algorithms (Math 541) F'08(5).
- Introduction to Computational Analysis (Math 581) FS'91–93(30).
- Research (Math 590) S'11(1), F'11(1), S'13(1), S'14(1), S'18(2).
- Seminar in Computational Analysis (Math 595) FS'91–92(11).
- Wavelet Applications Video Seminar (Math 595) S'96(10).
- Seminar (Math 596) S'08(1).
- Doctoral Continuing Student (Math 884) F'08(1), S'09(1), F'09(1), S'10(1), S'13(1), F'13(1), S'14(1), F'14(2), S'15(1).

- *University of Georgia Courses.*

- Measure Theory (Mat 800–801–802) FWS'86–87(3).
- Probability (Mat 471/671), F'87(8).
- Differential Equations (Mat 460/660), W'89(7).
- Differential Equations (Mat 461/661), S'89(5).
- Introduction to Differential Equations (Mat 358), F'88(8).
- Linear Algebra (Mat 256), W'87(21), S'87(11).
- Calculus III (Mat 255), F'87(18).
- Calculus II (Mat 254), S'88(10), F'88(39).
- Calculus I (Mat 253), F'85(10), W'86(28), S'86(29), F'86(21), W'89(34), W'90(25+24), S'90(21+25).
- Pre-Calculus (Mat 116), F'85(33), F'87(38).
- Trigonometry (Mat 109), W'86(23).

- *Yale University Courses.*
  - Advanced Calculus (Ma 260), 1981–82.
  - Calculus (Ma 120), 1982–84,1990.

- *External Dissertation Committees.*
  - Peter Fogh Odgaard, PhD, 2004, Aalborg University.
  - Stéphane Molla, PhD, 2003, Université de Provence (Aix-Marseille I).
  - Anders la Cour–Harbo, PhD, 2002, Aalborg University.

- *Washington University Graduate Committees.* (*thesis advisee)
  - David MEYER*, PhD, 2015.
  - Yinghui XIA, MS, 2014.
  - Qiaofeng XU, PhD, 2014.
  - Yao XIE*, PhD, 2014.
  - Chao CHANG*, PhD.
  - Xiao (Emma) HUANG, PhD, 2011.
  - Nathan Jacobs, PhD, 2010.
  - Wei ZHU*, PhD.
  - Min XU, 2006.
  - Wang-Q LIM, 2006.
  - Zoran Nenadić, 2001.
  - Elvir Čaušević, 2001.
  - Ziemovit Rzeszotnik, PhD, 2000.
  - Wojcieh Czaja*, PhD, 2000.
  - Sedigheh Deldar, PhD, 1999.

  - Morten Nielsen*, PhD, 1999.
  - Jonathan Corbett, PhD, 1999.
  - Matthew Lundberg*, PhD.
  - Mingqi KONG, PhD, 1999.
  - Sarah Littlewood*, PhD.
  - Suzanne Tourville*, PhD, 1997.
  - Xue-dong Dai, PhD, 1996.
  - Xihua Wang, PhD, 1995.
  - Theresa Manzara*, MS.
  - Srinivas Palavajjhala, PhD, 1994.
  - Mark Justin Jensen, PhD, 1994.
  - Robert A. Grothe, Jr., MS, 1992.
  - Susan Elaine Kelly, PhD, 1992.

- *Yale University Dissertation Committees.*
  - Chun-Chung Hsieh, PhD, 1990.
  - Derchyi Wu, PhD, 1990.
  - Tian-yue Tsai,PhD, 1989.

- *University of Georgia Graduate Committees.*
  - Chester Lin, PhD, 1987–90.
  - Reza Akhbari, PhD, 1987–90.
  - Moustafa Gad, MS, 1989–90.

9 Employment History

7/98—present Professor, Washington University.

1/22–7/22 Sabbatical Visitor, University of Zagreb.

2/98–6/98 Sabbatical Visitor, University of Maryland.

7/96 Visiting Associate Professor, CEREMADE—Université Paris-Dauphine.

7/95 Visiting Associate Professor, Universitá di Messina, Italy.

5/95 Visiting Associate Professor, Université Paris-Nord, France.

7/93 Visiting Associate Professor, CNRS/CPT, Luminy, France.

6/93 Visiting Associate Professor, CEREMADE—Université Paris-Dauphine.

5–6/92 Visiting Associate Professor, CNRS/CPT, Luminy, France.

1/92 Visiting Associate Professor, CEREMADE—Université Paris-Dauphine.

9/91–6/98 Associate Professor, Washington University.

5–6/91 Visiting Associate Professor, Université Aix-Marseilles.

9/90–9/91 Visiting Assistant Professor, Yale University.

9/85–9/90 Assistant Professor of Mathematics, University of Georgia.

6/84–9/85 Assistant in Research, Yale University. Supported by National Science Foundation grant DMS 8402637 with principal investigators Professors Richard Beals and Ronald R. Coifman.

9/82–5/84 Teaching Fellow, Yale University.

1–5/82 Teaching Assistant, Yale University.

6–8/81 Technical Assistant, NASA Ames Research Center, Moffett Field, California.

10/79–8/80 Programmer, Lockheed California Company, Burbank, California.

9/78–6/79 Grader for Mathematical Analysis at Caltech.

6–8/78 Richter Fellow in Mathematics at Caltech.

6–8/76, 6–8/77 Laboratory Technician, Red Cross Blood Research Laboratory, Bethesda, Maryland.

10 Academic and University Service

10.1 Washington University

10.1.1 University-Wide

- Computing Committee 1992–94
- Whittemore House Board of Directors 2000–2004

10.1.2 Mathematics Department

- Computing Committee 1994–present
- Tenure-Track Hiring Committee 2000–2001
- Undergraduate Committee 2000–present
- Statistics Committee 2004–present

10.2 Academic Conference Organization

- *Independent Component Analyses, Wavelets, and Neural Networks.* Tony Bell, MVW, and Harold H. Szu, chairs. SPIE AeroSense International Symposium, Orlando, Florida, 21–25 April 2003.
- *Five-Day Workshop on Applicable Harmonic Analysis.* Rong-Qing Jia, Sherman Riemenschneider, and MVW, organizers. Banff International Research Station, Alberta, Canada, 7–12 June 2003.

11 Other Activities

- Partner in *Numerics Medical Imaging Corporation*, February 1994 to December 1996.
- Partner in *Fast Mathematical Algorithms and Hardware Corporation*, December 1991 to December 1996.
- Owner of *Wickerhauser Consulting*, founded May, 1989.
- Vice President for Finances for the Yale Graduate and Professional Student Senate from May, 1983 until September, 1984.
- Senator from Mathematics in the Yale Graduate and Professional Student Senate from May, 1981 until May, 1983.
- Manager of the Caltech Student Coffeehouse from January, 1978 until August, 1980.

12 Miscellaneous Information

- *Foreign Languages:* Croatian, French, and Russian.
- *Miscellaneous Honors and Awards:*
  - Honorable mention, Westinghouse Science Talent Search, 1976.
  - Renssalaer Medal, 1976.
  - Society of Actuaries Highest Regional Score Award, MAA Annual High School Mathematics Competition, 1975.
  - Eagle Scout, 1975.
- *Ratings:* Private Pilot (Airplane) certificate, 1981.
- *Clearances:* "Confidential" (DOD) security clearance, 1979.

13 Publications

[1] Mladen Victor Wickerhauser. Cyber 2xx performance on an implicit factored Navier–Stokes algorithm. Preprint, NASA Ames Research Center, 1981.

[2] Mladen Victor Wickerhauser. *Nonlinear Evolutions of the Heat Operator*. PhD thesis, Yale University, New Haven, Connecticut, May 1985.

[3] Mladen Victor Wickerhauser. Inverse scattering for the heat operator and evolutions in 2+1 variables. *Communications in Mathematical Physics*, 108:67–89, 1987.

[4] Mladen Victor Wickerhauser. Hamilton's form for the Kadomtsev–Petviashvili equation. *Journal of Mathematical Physics*, 29:2300–2302, 1988.

[5] Ronald R. Coifman and Mladen Victor Wickerhauser. The scattering transform for the Benjamin–Ono equation. *Inverse Problems*, 6:825–861, 1990.

[6] Elliot Gootman and Mladen Victor Wickerhauser. Elementary wavelets. Preprint, 02021-88, Mathematical Sciences Research Institute, Berkeley, California, 1987-88.

[7] Mladen Victor Wickerhauser. Fast approximate factor analysis. In Martine J. Silbermann and Hemant D. Tagare, editors, *Curves and Surfaces in Computer Vision and Graphics II*, volume 1610 of *SPIE Proceedings*, pages 23–32, Boston, October 1991. SPIE.

[8] Lareef Zubair, Kannan R. Sreenivasan, and Mladen Victor Wickerhauser. Characterization and compression of turbulent signals and images using wavelet packets. In T. Gadsky, S. Sirkar, and C. Speziale, editors, *Studies in Turbulence*, pages 489–513. Springer Verlag, New York, 1991.

[9] Mladen Victor Wickerhauser. Acoustic signal compression with wavelet packets. In Chui [114], pages 679–700.

[10] Mladen Victor Wickerhauser. INRIA lectures on wavelet packet algorithms. In Pierre-Louis Lions, editor, *Problémes Non-Linéaires Appliqués, Ondelettes et Paquets D'Ondes*, pages 31–99. INRIA, Roquencourt, France, June 1991. Minicourse lecture notes.

[11] Mladen Victor Wickerhauser. *Lectures on Wavelet Packet Algorithms.* Washington University, Saint Louis, Missouri, 18 November 1991.

[12] Marie Farge, Eric Goirand, Thierry Philipovitch, Freédéric Pascal, and Mladen Victor Wickerhauser. Wavelet packets compression of a 2d turbulent flow. Video recording of a computer simulation performed at LMD-CNRS, Paris, 1991.

[13] Ronald R. Coifman, Yves Meyer, and Mladen Victor Wickerhauser. Wavelet analysis and signal processing. In Ruskai et al. [113], pages 153–178.

[14] Ronald R. Coifman, Yves Meyer, and Mladen Victor Wickerhauser. Size properties of wavelet packets. In Ruskai et al. [113], pages 453–470.

[15] Ronald R. Coifman and Mladen Victor Wickerhauser. Entropy based algorithms for best basis selection. *IEEE Transactions on Information Theory*, 32:712–718, March 1992.

[16] Pascal Auscher, Guido Leopold Weiss, and Mladen Victor Wickerhauser. Local sine and cosine bases of Coifman and Meyer and the construction of smooth wavelets. In Chui [114], pages 237–256.

[17] Mladen Victor Wickerhauser. *Adapted Waveform Analysis Library, v2.0.* Fast Mathematical Algorithms and Hardware Corporation, Hamden, Connecticut, June 1992. Software Documentation.

[18] Mladen Victor Wickerhauser. High-resolution still picture compression. *Digital Signal Processing: a Review Journal*, 2(4):204–226, October 1992.

[19] Ronald R. Coifman, Yves Meyer, and Mladen Victor Wickerhauser. Numerical harmonic analysis. In Charles Fefferman, Robert Fefferman, and Stephen Wainger, editors, *Essays on Fourier Analysis in Honor of Elias M. Stein*, pages 162–174, Princeton, New Jersey, 1991. Princeton University Press. Proceedings of the Princeton Conference in Harmonic Analysis, held 13–17 May 1991.

[20] Ronald R. Coifman, Yves Meyer, and Mladen Victor Wickerhauser. Adapted waveform analysis, wavelet-packets and applications. In Robert E. O'Malley Jr., editor, *ICIAM 91: Proceedings of the Second International Conference on Industrial and Applied Mathematics, 8–12 July, 1991*, pages 41–50, Philadelphia, 1992. SIAM, SIAM Press.

[21] Mladen Victor Wickerhauser. Computation with adapted time-frequency atoms. In Meyer and Roques [115], pages 175–184.

[22] Ronald R. Coifman, Yves Meyer, Stephen R. Quake, and Mladen Victor Wickerhauser. Signal processing and compression with wavelet packets. In Meyer and Roques [115], pages 77–93.

[23] Ronald R. Coifman and Mladen Victor Wickerhauser. Wavelets and adapted waveform analysis. In Benedetto and Frazier [116], pages 399–423.

[24] Frédéric Heurtaux, Fabrice Planchon, and Mladen Victor Wickerhauser. Scale decomposition in Burgers' equation. In Benedetto and Frazier [116], pages 505–523.

[25] Marie Farge, Eric Goirand, Yves Meyer, Frédéric Pascal, and Mladen Victor Wickerhauser. Improved predictability of two-dimensional turbulent flows using wavelet packet compression. *Fluid Dynamics Research*, 10:229–250, 1992.

[26] Mladen Victor Wickerhauser. Smooth localized orthonormal bases. *Comptes Rendus de l'Académie des Sciences de Paris*, 316:423–427, 1993.

[27] David Rochberg and Mladen Victor Wickerhauser. WPLab version 3.03 (for NeXT computers). Available by anonymous FTP from wuarchive.wustl.edu, 1992.

[28] He Ouyang and Mladen Victor Wickerhauser. WSQ – the FBI/Yale/Los Alamos [W]avelet-packet [S]calar [Q]uantization fingerprint compression algorithm, for Windows 3.1 or higher. Executable is available by anonymous FTP from wuarchive.wustl.edu, 8 September 1993.

[29] Ronald R. Coifman and Mladen Victor Wickerhauser. Wavelets and adapted waveform analysis: A toolkit for signal processing and numerical analysis. In Daubechies [117], pages 119–153. Minicourse lecture notes.

[30] Mladen Victor Wickerhauser. Best-adapted wavelet packet bases. In Daubechies [117], pages 155–171.

[31] Eva Wesfreid and Mladen Victor Wickerhauser. Adapted local trigonometric transform and speech processing. *IEEE Transactions on Signal Processing*, 41(12):3596–3600, December 1993.

[32] Christophe D'Alessandro, Xiang Fang, Eva Wesfreid, and Mladen Victor Wickerhauser. Speech signal segmentation via Malvar wavelets. In Meyer and Roques [115], pages 305–308.

[33] Eric Goirand, Mladen Victor Wickerhauser, and Marie Farge. A parallel two dimensional wavelet packet transform and its application to matrix-vector multiplication. In Rodolphe L. Motard and Babu Joseph, editors, *Wavelet Applications in Chemical Engineering*, pages 275–319. Kluwer Academic Publishers, Norwell, Massachusetts, 1994.

[34] Eva Wesfreid and Mladen Victor Wickerhauser. Traitement de la parole par ondelettes de Malvar. In J. P. Haton, editor, *Reconnaisance Automatique de la Parole*, Actes du Séminaire. CRIN/INRIA–Nancy, 10–11 March 1994.

[35] Mladen Victor Wickerhauser. Large-rank approximate principal component analysis with wavelets for signal feature discrimination and the inversion of complicated maps. *Journal of Chemical Information and Computer Science*, 34(5):1036–1046, September/October 1994.

[36] Mladen Victor Wickerhauser. Two fast approximate wavelet algorithms for image processing, classification, and recognition. *Optical Engineering*, 33(7):2225–2235, July 1994. Special issue on Adapted Wavelet Analysis.

[37] Ronald R. Coifman and Mladen Victor Wickerhauser. Adapted waveform analysis as a tool for modeling, feature extraction, and denoising. *Optical Engineering*, 33(7):2170–2174, July 1994. Special issue on Adapted Wavelet Analysis.

[38] Mladen Victor Wickerhauser. Wavelet approximations to Jacobians and the inversion of complicated maps. In Harold H. Szu, editor, *Wavelet Applications*, volume 2242 of *SPIE Proceedings*, pages 100–118, Orlando, Florida, 5–8 April 1994. SPIE.

[39] Mladen Victor Wickerhauser. An adapted waveform functional calculus. In Moody Chu, Robert Plemmons, David Brown, and Donald Ellison, editors, *Proceedings of the Cornelius Lanczos Centenary, Raleigh, North Carolina, 12–17 December 1993*, pages 418–421, Philadelphia, 1994. SIAM, SIAM Press.

[40] Mladen Victor Wickerhauser. *Adapted Wavelet Analysis from Theory to Software*. A K Peters, Ltd., Natick, Massachusetts, 1994.

[41] Mladen Victor Wickerhauser, Marie Farge, Eric Goirand, Eva Wesfreid, and Echeyde Cubillo. Efficiency comparison of wavelet packet and adapted local cosine bases for compression of a two-dimensional turbulent flow. In Chui et al. [118], pages 509–531.

[42] Mladen Victor Wickerhauser. Comparison of picture compression methods: Wavelet, wavelet packet, and local cosine transform coding. In Chui et al. [118], pages 585–621.

[43] Mladen Victor Wickerhauser. Time localization techniques for wavelet transforms. In Richard J. Mammone and J. David Murley Jr, editors, *Automatic Systems for the Identification and Inspection of Humans*, volume 2277 of *SPIE Proceedings*, page 18, San Diego, California, 24–29 July 1994. SPIE, SPIE.

[44] Ronald R. Coifman, Yves Meyer, Stephen R. Quake, and Mladen Victor Wickerhauser. Signal processing and compression with wavelet packets. In James S. Byrnes, Jennifer L. Byrnes, Kathryn A. Hargreaves, and Karl Berry, editors, *Wavelets and Their Applications*, volume 442 of *NATO ASI Series C: Mathematical and Physical Sciences*, pages 363–379. Kluwer Academic Publishers, Dordrecht/Boston/London, 1994. Proceedings of the NATO Advanced Study Institute at Il Ciocco, Barga, Italy in August, 1992.

[45] Mladen Victor Wickerhauser. Smooth localized orthonormal bases. In Alfred Z. Msezane and Katrina L. Barnum, editors, *Proceedings of the Sixth Annual Conference of the National Alliance of Research Centers of Excellence*, pages 160–173, Clark Atlanta University, Atlanta, Georgia 30314, 17–19 March 1994. The Center for Theoretical Studies of Physical Systems. Longer version of [26].

[46] Mladen Victor Wickerhauser. *AWA 3: Adapted Wavelet Analysis Library, version 3*. Fast Mathematical Algorithms and Hardware Corporation, Hamden, Connecticut, June 1995. Software Documentation.

[47] Mladen Victor Wickerhauser. Time localization techniques for wavelet transforms. *Croatica Chemica Acta*, 68(1):1–27, April 1995. Proceedings of the Ninth Dubrovnik International Course and Math-Chem-Comp 1994.

[48] Ronald R. Coifman and Mladen Victor Wickerhauser. Adapted waveform "de-noising" for medical signals and images. *IEEE Engineering in Medicine and Biology*, 14(5):578–586, September/October 1995.

[49] Mladen Victor Wickerhauser. **Wavelets: Algorithms and Applications** by Yves Meyer. *SIAM Review*, 36(526–528):526–528, September 1994. Book review.

[50] Nikolaj Hess-Nielsen and Mladen Victor Wickerhauser. Wavelets and time-frequency analysis. *Proceedings of the IEEE*, 84(4):523–540, April 1996. Special issue on wavelet applications.

[51] Valerie Perrier and Mladen Victor Wickerhauser. Multiplication of short wavelet series using connection coefficients. In Ka-Sing Lau, editor, *Advances in Wavelets*, pages 77–101. Springer-Verlag, Singapore, 1999.

[52] Aurelija Trgo and Mladen Victor Wickerhauser. A relation between Shannon–Weaver entropy and "theoretical dimension" for classes of smooth functions. Preprint, Washington University, Saint Louis, Missouri, 1995.

[53] Ronald R. Coifman and Mladen Victor Wickerhauser. Experiments with adapted wavelet de-noising for medical signals and images. In Metin Akay, editor, *Time-Frequency and Wavelets in Biomedical Signal Processing*, pages 323–346. IEEE Press, Piscataway, New Jersey, 1998.

[54] Mladen Victor Wickerhauser, Marie Farge, and Eric Goirand. Theoretical dimension and the complexity of simulated turbulence. In Wolfgang Dahmen, Peter Oswald, and Andrew J. Kurdila, editors, *Multiscale Wavelet Methods for Partial Differential Equations*, volume 6 of *Wavelet Analysis and Applications*, pages 473–492. Academic Press, Boston, 1996.

[55] Mladen Victor Wickerhauser. *Adaptive Wavelet-Analysis, theorie und software*. Vieweg Verlag, Braunschweig/Wiesbaden, 12 December 1995. German translation of [40].

[56] Mladen Victor Wickerhauser. Custom wavelet packet image compression design. In Todor Cooklev, editor, *Proceedings of the 3rd International Workshop on Image and Signal Processing, Manchester, UK, 4-7 November 1996*, page 6, Manchester, UK, 1996. UMIST, UMIST.

[57] Ronald R. Coifman and Mladen Victor Wickerhauser. Wavelets, adapted waveforms, and de-noising. In Richard M. Dashieff and Diana J. Vincent, editors, *Continuous Wave-Form Analysis*, Electroencephalography and Clinical Neurophysiology, Supplement 45, pages 57–78. Elsevier, New York, 1 September 1996.

[58] Gregory Beylkin and Mladen Victor Wickerhauser. Multi-scale cross-correlation in wavelet coordinates. Preprint, Washington University, Saint Louis, Missouri, 21 January 1996.

[59] Hrvoje Šikić and Mladen Victor Wickerhauser. Information cost functions. *Applied and Computational Harmonic Analysis*, 11(2):147–166, September 2001.

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