

Resumé of M. Zuhair Nashed

Current Position: Professor of Mathematics
University of Central Florida
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Education:

Massachusetts Institute of Technology, S.B., 1957, and S.M. 1958, in Electrical Engineering
The University of Michigan at Ann Arbor, M.S., Ph.D., 1963, in Mathematics

Academic and Research Positions:

Georgia Institute of Technology: Assistant Professor of Mathematics, 1963-65; Associate Professor, 1965-69; Professor, 1969-71, 1972-76.

The University of Delaware
Professor of Mathematics, 1977-2002.
Professor of Electrical Engineering, 1983-2002.

The University of Central Florida: Professor and Chair, 2002 – 2006; Professor, 2002 – present.

Concurrent and/or Visiting Positions:

Mathematics Research Center, the University of Wisconsin-Madison
Visiting Research Associate Professor, Spring 1967
Visiting Professor, 1970-72, Summer 1973

American University of Beirut, Lebanon: Associate Professor, 1967-69

University of Michigan, Ann Arbor: Visiting Professor, 1976-77

University of Petroleum and Minerals, Dhahran, Saudi Arabia: Visiting Professor, 1983-85

Various short visiting appointments (2 weeks – 2 months) at several universities and research institutes in North America, Europe, Australia, the Middle East, China, Japan and Malaysia.

Research Interests: Integral and operator equations; inverse and ill-posed problems; numerical functional analysis; nonlinear functional analysis; optimization and approximation theory; operator theory and generalized inverses; sampling theory and signal analysis; inverse problems in engineering, optimal control theory and signal processing; computational conformal mappings; variational inequalities and set-valued analysis; reproducing kernel spaces.

Editorial Boards:

Editor-in-Chief, *Numerical Functional Analysis and Optimization* (Taylor & Francis)

(One of four) Editor-in-Chief, *Sampling Theory in Signal and Image Processing* (Sampling Publishing)

Member of Editorial Boards of the following journals:

- *Nonlinear Analysis: Theory, Methods & Applications* (Elsevier)
- *Mathematical Results* (Birkhäuser)
- *Set-Valued and Variational Analysis: Theory and Applications* (Springer)
- *Calcolo* (Springer Verlag)
- *Involve* (Mathematical Sciences Publishers, UC Berkeley)
- *Journal of Computational Analysis and Applications*
- *Applicable Analysis* (Taylor and Francis)
- *International Journal of Computing Science and Mathematics* (Inderscience Publishers, UK)
- *Dynamic Systems and Applications* (Dynamic Systems, Inc.)
- *Journal of the Indian Society for Industrial and Applied Mathematics*
- *Sampling Theory in Signal and Image Processing* (Sampling Publishing)
- *Advances in Theoretical and Applied Mathematics*
- *Journal of Inequalities in Pure and Applied Mathematics*, an electronic journal, (Victoria University, Australia)
- *Journal of Functional Analysis and Approximation Theory*
- *International Journal of Pure and Applied Mathematics*
- *International Journal of Applied Mathematical Sciences* (GBS Publishers)
- *Honom Mathematical Journal* (Korea)
- *Jordan Journal of Mathematics and Statistics*
- *Communications in Applied Nonlinear Analysis*
- *Arab Journal of Mathematics and Mathematical Sciences*
- *Karachi Journal of Mathematics*
- Advisory Board: *Arabian J. Mathematical Sciences* (Saudi Arabia)

Pure and Applied Mathematics Program (Monographs, Textbooks, and Lecture Notes), Marcel Dekker, Inc., of New York, Basel and Hong Kong, acquired and continued by Chapman and Hall/CRC, Taylor & Francis.

Member of the Editorial Board, 1979-82
Executive Editor, 1983-present.

Past Editorial Boards: Associate editor of *Journal of Computer and System Sciences* (Academic Press).
Member of Editorial Board: *Differential and Integral Equations* (Ohio University), *International Journal of Mathematics and Mathematical Sciences*, *Stochastic Analysis and Applications* (Marcel

Dekker, Inc.), International Advisory Panel for the journal *Inverse Problems* (Institute of Physics), Scientific Advisory Board of *Methods of Operations Research*. Advisory Board of *World Scientific Series in Applicable Analysis*.

Founding Editor (with the late Albert Bharucha-Reid) of *Journal of Integral Equations*, and of its successor (with P.M. Anselone) *Journal of Integral Equations and Applications* (and Editor till 2006).

Professional and Honorary Society Memberships: Professional and honorary society (current or recent) memberships include American Mathematical Society, Mathematical Association of America, Society for Industrial and Applied Mathematics, Institute of Electrical and Electronics Engineers, Association for Women in Mathematics, London Mathematical Society, Austrian Mathematical Society, International Society for Interaction of Mathematics and Mechanics, International Federation of Nonlinear Analysts, American Association for the Advancement of Science, American Association of University Professors, Sigma Xi, and Eta Kappa Nu.

Publications:

Author or co-author of over 120 research papers. Contributions include papers in the following journals:

Mathematical Journals:

Bulletin of American Mathematical Society
Proceedings of the American Mathematical Society
Transactions of the American Mathematical Society
Mathematics of Computation
SIAM Journal on Applied Mathematics
SIAM Journal on Mathematical Analysis
SIAM Journal on Numerical Analysis
SIAM Journal on Optimization
SIAM Review
Journal of the London Mathematical Society
Annali della Scuola Normale Superiori di Pisa
Rendiconti Accademia Nazionale Dei Lincei
American Mathematical Monthly
Mathematics Magazine
Journal of Fourier Analysis and Applications
Advances in Computational Mathematics
Numerische Mathematik
Mathematics of Control, Signals and Systems
Applied Mathematics and Optimization
Journal of Optimization Theory and Applications
Pacific Journal of Mathematics
Journal of Mathematics and Mechanics/Indiana J. of Mathematics
Journal of Functional Analysis
Journal of Approximation Theory
Journal of Integral Equations
Nonlinear Analysis: Theory, Methods & Applications
Applicable Analysis
Abstract and Applied Analysis
Set-Valued Analysis
Resultate der Mathematik/Mathematical Results
Journal of Mathematical Analysis and Applications
Inverse Problems
Journal of Inverse and Ill-Posed Problems
Differential and Integral Equations
Journal of Integral Equations and Applications
Numerical Functional Analysis and Optimization

Linear Algebra and Its Applications
Commentationes Mathematicae Universitatis Carolinae
Mediterranean Journal of Mathematics
Mathematical Methods in the Applied Sciences
Comptes Rendus Mathématiques de l' Académie des Sciences (Canada)
Journal of Computational and Applied Mathematics
ZAMM, Z. Angew. Math. Mech.
Analysis (Munich)
Journal of Computers and Mathematics with Applications
Journal of Computational Analysis and Applications
International J. Wavelets, Multiresolution, and Information Processing
Communications in Applied Analysis

Engineering, Physics and Applied Sciences Journals:

IEEE Transactions on Antennas and Propagation (invited)
Foundations of Physics
Z. Angew. Math. Mech
Zeitschrift für Operations Research
Mathematical Methods in Engineering (Elsevier)
Applied Optics (Taylor & Francis)
Remote Sensing of Environment (Elsevier)

Author of over 30 expository and invited survey articles in several edited books.

Editor of: *Generalized Inverse and Applications*, Academic Press, 1976 and "*Functional Analysis Methods in Numerical Analysis*," Springer-Verlag, 1979. Co-editor of "*Mathematical Analysis, Wavelets and Signal Processing*," American Mathematical Society, 1995. Co-editor of "*Approximation Theory*," Marcel Dekker, Inc. 1998. Co-editor of "*Inverse Problems and Image Analysis, and Medical Imaging*," American Mathematical Society, 2002. Author of the Mathematics Chapter in Perry's *Chemical Engineering Handbook*, 6th edition, McGraw-Hill. Contributor of short articles in encyclopedias.

Author of over fifty invited book reviews which appeared in the *Bulletin of the American Mathematical Society*, *SIAM Review*, *American Mathematical Monthly*, *Canadian Mathematical Bulletin*, *Mathematics of Computation*, *Mathematical Reviews*, *Zentralblatt für Mathematik* and *Zeitschrift für Operations Research, Series A: Theory*.

Honors and Awards

A recipient of the Lester R. Ford Award of the Mathematical Association of America, 1967. (This is an award for an expository paper.)

Sigma Xi Faculty Research Award in 1965 and 1973; Sustained Research Award in Science, 1976.

Invited hour address at the 710th meeting of the American Mathematical Society, 1973.

Fellow at the Center for Advanced Studies, University of Delaware, 1982-83.

Distinguished Researcher Award, UPM, 1985.

Opening and Closing Plenary Lectures, at MAA meeting in New Orleans, 75th anniversary of the Louisiana Section, 1998.

Plenary lectures at several meetings of engineering societies in the USA, Europe and Japan, 1982-2004.

Invitation to nominate candidates for the Kyoto Prize in Basic Sciences 1998, 2002.

Research Grants and Contracts

Principal Investigator of research grants from the U.S. Army Research Office, National Science Foundation, National Aeronautics and Space Administration. Co-PI on research grant, Lockheed Martin and I4.

Grants for International Symposia

Principal Investigator of grants from the Army Research Office and the Air Force Office of Scientific Research for organizing an International Symposium on Ill-Posed Problems: Theory and Applications. Co-Principal Investigator of NSF grants for three international conferences.

Curriculum Grants

Co-investigator in a five year grant from NSF to develop an interdisciplinary program (instructional and research) in Systems Engineering. Participant in several NSF grants for undergraduate and graduate programs.

Consulting

Consultant to several industrial corporations and government research laboratories, including Bendix Corporation (Huntsville, Alabama), Langley Research Center (Virginia) and Aberdeen Proving Ground (Maryland).

Selected Professional Activities/Supplementary Information:

SIAM Visiting Lecturer, 1972-75, 1993-present. Invited speaker at over thirty Special Sessions at AMS meetings. Visiting Scholar and Distinguished Lecturer at several universities in the U.S.A. and abroad. Principal lecture at the Sixth Annual Conference on Undergraduate Mathematics, 1982. Invited hour address at a meeting of the Mathematical Association of America, April, 1986. Invited speaker at 14 Oberwolfach Conferences, 1975-2005. Principal speaker at several faculty enhancement workshops sponsored by NSF or the Mathematical Association of America.

Invited speaker at over 150 international conferences and symposia; colloquium lecturer at over 200 universities in North America, Europe, Australia, the Middle East, Japan, Singapore, Malaysia, P.R. China, India and Pakistan.

Organized and lectured in short courses on nonlinear and numerical analysis, inverse problems, optimization and approximation methods at Georgia Tech, and was a guest lecturer in similar programs at UCLA and other universities. Consulted in these areas at the Ballistic Research Labs, Maryland, Langley Research Center, Virginia, Battelle, and other government, industrial, and educational institutions. Organized 15 Special Sessions at meetings of the American Mathematical Society, organized three mini symposia at SIAM meetings; invited speaker and organizer of several sessions at the International Congress of Nonlinear Analysts (1992, 1996, 2000, 2004, 2008).

Served on external evaluation committees for mathematics departments and College of Science for several universities in the U.S.A. and abroad.

Member of the Review Committee for Mathematics for the Board of Regents of the University of Florida Systems (1990). Co-chair, Advisory Committee, Interdisciplinary Center for Computational Sciences, Atlanta University, 1987.

Program Chairman of the Advanced Seminar on "Generalized Inverses and Applications" held at the University of Wisconsin-Madison, October 8-10, 1973; Chairman and invited speaker at the SIGNUM Session of the 1973 National Meeting of the Association for Computing Machinery, Organizer, Special Session on "Functional Analysis Methods in Numerical Analysis", 83rd Annual Meeting of AMS, January 26-30, 1977, Special Session on "Integral Equations with Emphasis on

Fredholm and Hammerstein Equations,” 85th annual meeting of AMS, January 24-27, 1979; Organizer, Special Session on “Ill-Posed Problems in Systems Theory,” International Symposium on Mathematical Theory of Networks and Systems, July 3-6, 1979, Delft University of Technology, The Netherlands; Chairman of the International Symposium on “Ill-Posed Problems: Theory and Practice,” (sponsored by the Air Force Office of Scientific research and the Army Research Office), held at the University of Delaware, October 2-6, 1979; Principal Lecturer, Workshop on Applications of Linear Algebra, the MD-DC-VA Section of the MAA, June, 1980; gave one month advanced seminar on “Mathematics of Earth Science” at the Scuola Matematica Interuniversitaria of Pisa, at Corona, Italy, a series of twenty lectures on inverse and ill-posed problems. Organizer of Special Session on “Adjoint Subspaces and Boundary Problems, Annual Meeting of AMS, January 1982, Special Session on “Interaction of harmonic Analysis, Signal Processing and Computational Mathematics,” Annual Meeting of AMS, Baltimore, January 1992, Scientific Advisory Committee, Alpine-U.S. Seminar on Inverse and Ill-Posed Problems, 1986. Member of the Organizing Committee, of several international conferences, most recently the “International Conference on Inverse Problems and Their Applications in Geophysics, Medicine and Technology” (Potsdam, Germany, August 30-September 3, 1993) and the “International conference on Mathematical Analysis and Signal Processing” (Cairo, January 3-9, 1994), partially supported by an NSF grant. Member of the Scientific Program/Organizing Committee of numerous international conferences including conference on inverse problems held in Moscow (1991, 1996), Osaka (1995), Ho Chi Minh City (1996), Manila (1989), and the Mathematics Conference at Bir-Zeit University (1998), partly supported by NSF, International Conference on Fourier Analysis & Applications, Kuwait, 1998, International Conference on Industrial Mathematics, Madras, 2000. Organizer of Special Sessions at annual meeting of the AMS: “Inverse Problems and Signal Analysis”, January, 1998; “Inverse Problems, Image Analysis, and Medical Imaging”, January, 2000; “Sampling Theory in Inverse Problems and Signal Analysis”, January, 2002. Member of Award Committee for Graduate Students Papers, SIAM, 1999-2003.

Listed in current or earlier editions of Who’s Who in the World, Who’s Who in America, American Men and Women of Science, Who’s Who in the East, Who’s Who in the South and Southeast, Men and Women in Distinction, Who’s Who in Technology Today, Who’s Who in American Education, and in several other international biographical books.

Selected Publications from 1998-2007:

1. Nonuniform multiresolution analyses and spectral pairs, with Jean-Pierre Gabardo, *J. Functional Analysis*, **158** (1998), 209-231.
2. On some partial integral equations arising in the mechanics of solids, with J. Appell and A. S. Kalitvin, *ZAMM-Z. Angew. Math. Mech.*, **79** (1999), 703-713.
3. Numerical conformal mapping for exterior regions via the Kerzman-Stein kernel, with A. H. Murid and M.R. Razali, *J. Integral Equations and Applications*, **10** (1998), 517-532.
4. Some integral equations related to the Riemann map, with A.H. Murid and M.R. Razali, *Computational Methods and Function Theory* (N. Papamichael, St. Ruscheweyh and E.B. Saff, eds.), World Scientific Publishing Co., 1999, pp. 405-419.
5. Least squares and bounded variation regularization with nondifferentiable functions, with O. Scherzer, *Numer. Funct. Anal. Optimiz.*, **19** (1998), 873-901.
6. Smoothing methods and semismooth Newton methods for nondifferentiable operator equations, with X. Chen and L. Qi, Applied Math. Report AMR 99/7, University of New South Wales, May 1999, *SIAM J. Numer. Analysis*, **38** (2000), 1200-1216.
7. An analogue of A. Cohen’s condition for nonuniform multiresolution analyses, in “Wavelets, Multi-wavelets and their Applications” (A. Aldroubi and E.B. Lin, eds.), *Contemporary Mathematics*, vol. 216, pp. 41-61, American Mathematical Society, Providence, R.I., 1998.

8. Regularization of nonlinear ill-posed variational inequalities and convergence rates, with F. Liu, *Journal of Set-Valued Analysis*, **6** (1998) 313, 344.
9. A domain integral equation for the Bergman kernel, with A. H. Murid and M.R. Razali, *Resultate der Mathematik/Mathematical Results*, **35** (1999), 161-174.
10. Stable recovery of analytic functions using basic hypergeometric series, with V.K. Tuan, *Journal of Computational Analysis and Applications*, **3** (2001), 33-51.
11. Paley-Wiener type theorems by transmutations with A. Boumenir, *J. Fourier Analysis and Applications*, **7** (2001), 395-417.
12. Sampling expansions and interpolation in unitarily translation invariant reproducing kernel Hilbert spaces, with C. Van der Mee and S. Seatzu, *Advances in Computational Mathematics*, **19** (2003), 355-372.
13. Iterative-projection regularization of ill-posed variational inequalities, with Y. Alber, *Analysis (Munich)*, **24** (2004), 19-39.
14. Marcia Kashimoto and Zuhair Nashed, A Choquet-Deny-type theorem and applications to approximation in weighted spaces, *Mediterr. J. Math.*, **2** (2005), 407-416.
15. L. Gongsheng and Z. Nashed, A modified Tikhonov regularization for linear operator equations, *Numer. Funct. Anal. Optimiz.*, **26** (2005), 543-564.
16. Zuhair Nashed, Applications of Wavelets and Kernel Methods in Inverse Problems, in “*Integral Methods in Science and Engineering*”, C. Constanda, Z. Nashed, and D. Rollins, eds., Birkhauser, Boston, 2006, pp. 189 – 197.
17. Y. Wang, Z. Wen, Z. Nashed and Q. Sun, Direct fast method for time-limited signal reconstruction, *Applied Optics*, **45** (2006), 3111 – 3126.
18. C.W. Groetsch and M. Z. Nashed, Kendall Eugene Atkinson: an appreciation, *J. Integral Equations Appl.*, **18** (2006), 1 – 11.
19. M. S. Kashimoto and M. Z. Nashed, A note on factorization of bounded linear operators, *Communications in Applied Analysis*, **11** (2007), 97-102.
20. Y. Wang, Z. Wen, Z. Nashed and Q. Sun, On direct method for time-limited signal and image reconstruction and enhancement, *Int. J. Wavelets, Multiresolution and Information Processing*, **5** (2007), 51-68.
21. Y. Wang, X. Li, Z. Nashed, F. Zhao, H. Yang, Regularized kernel-based BRDF model inversion for ill-posed land surface parameter retrieval, *Remote Sensing of Environment*, **111** (2007), 36 – 50.

Edited Books (2002 – 2208)

1. **Inverse Problems, Image Analysis, and Medical Imaging**, with O. Scherzer, co-editor, *Contemporary Mathematics*, vol. 313, American Mathematical Society, Providence, RI, 2002, 305 pp.
2. **Mathematical Models and Methods for Real World Systems**, K. M. Furati, Z. Nashed, and A. H. Siddiqi, editors, Chapman & Hall/CRC, Boca Raton, FL, 2006, 455 pp.
3. **Integral Methods in Science and Engineering: Theoretical and Practical Aspects**, C. Constanda, Z. Nashed, and D. Rollins, editors, Birkhauser, Boston, 2006, 312 pp.

4. **Frontiers in Interpolation and Approximation**, dedicated to the memory of Ambikeshwar Sharma, N. K. Govil, H. M. Mhaskar, R. N. Mohapatra, Z. Nashed, and J. Szabados, editors, Chapman & Hall/CRC, Boca Raton/London/New York, 2006, 431 pp.
5. **Advances in Applied and Computational Mathematics**, F. Liu, Z. Nashed, G. M. N'Guerekata, editors, Nova Science Publishers, New York, 2006, 280 pages.
6. **Frames and Operator Theory in Analysis and Signal Processing**, D. R. Larson, P. Massopust, Z. Nashed, M. C. Nguyen, M. Papadakis, and A. Zayed, editors, *Contemporary Mathematics*, vol. 451, American Mathematical Society, Providence, RI, 2008, 291 pp.

Courses Taught at the University of Delaware

Graduate and Special Topics Courses: Integral Equations, Nonlinear Integral Equations, Functional Analysis, Numerical Analysis I & II, Nonlinear Functional Analysis, Inverse and Ill-Posed Problems, Numerical Functional Analysis, Measure Theory and Integration, Vector Spaces, Advanced Matrix Analysis, Calculus of Variations, Topics in Mathematical Programming and Convex Analysis, Topics in Reproducing Kernels, Signal Analysis and Operator Theory.

Undergraduate: Calculus, Calculus for Business, Differential Equations, Linear Algebra, Finite Mathematics, Advanced Calculus for Applications, Analysis I & II, Introduction to Proofs, Numerical Algorithms, Numerical Linear Algebra, Intuitive Principles of Optimization and Approximations (Special Topics Course funded by the Provost).

Courses Taught at the University of Central Florida:

Graduate: Inverse Problems, Hilbert Spaces and Applications, Integral Equations, Advanced Linear Algebra with Applications, Applied Mathematics.

Undergraduate: Calculus I and II, Differential Equations, College Trigonometry.

Supervision of Students' Research:

Ph.D. dissertation advisor to 9 Ph.D. students at the University of Delaware, Georgia Institute of Technology, the University of Michigan, Washington University in St. Louis, University of Linz (Austria) and the Technological University of Malaysia.

External examiner for several Ph.D. dissertations at other universities including McGill University, The University of Melbourne (Australia), IIT-Bombay, IIT-Madras, and Indian Institute of Science. External examiner for several Ph.D. dissertations "habilitations" at universities in Germany and Austria.

Advisor of several master theses. Supervisor of several undergraduate research experiences for students in mathematics, physics, and engineering. Member of over 30 Ph.D. dissertation committees in mathematics, engineering, physics, operations research and economics.

Committee Service: Served as a member or chair of various departmental and college committees at the University of Delaware, Georgia Tech, and other Institutions, including Undergraduate Committee, Graduate Committee, Faculty Search Committee, Planning Committee, Executive Committee, P. & T Committee, Library Committee, Committee on Minorities, Colloquium Committee, Distinguished Lecturer Committee, Peer Review Committees, Chair Search Committee. Served as a representative of the Mathematics Department in the University Faculty Senate.

Selected Sample of Professional Activities from the Academic Year 2001-2002:

Society for Industrial and applied Mathematics: SIAM Visiting Lecturer, Chair, SIAM Visiting Lecturer Program, Award Committee for Graduate Student Papers, Organizer of mini-symposia on "The influence of functional analysis on applied and computational mathematics in the last 50

years” and “The influence of functional analysis on the teaching of engineering mathematics: the good things and the bad,” SIAM 50th anniversary meeting (July 2002), member of the SIAM Education Committee.

Invited Plenary Talks at International Conferences on Integral Methods in the Applied Sciences (France, July 2002), Recent Advances in Computational Mathematics (Japan, October 2001), Inverse and Ill-Posed Problems (Novosibirsk, August 2002), Recent Trends in Science and Technology (Lebanon, March 2002), Abstract and Applied Analysis (Vietnam, August 2002), Nonlinear Functional Analysis and Applications (People’s Republic of China, August 2002).

Co-chair, Organizing Committee of the International Conference on Abstract and Applied Analysis; member of the Program Committee for the “international conference on inverse and ill-posed problems,” in honor of the 70th birthday of M.A. Lavrentiev; member of the International Program Committee for the Conference on “Inverse Problems: Modeling and Simulation..” Member of the Program Committee of the Conference “Recent Advances in Computational Mathematics,” (Japan).

For a list of publications reviewed in the *Mathematical Reviews*, see MathSciNet. Conferences and professional activities from 2003 on will be posted in Fall 2008.