

Bruce A. Wade

Vita

April, 2008

Specialty

Numerical analysis, computational mathematics, industrial mathematics

Professional Education

- B.S., Mathematics, University of Wisconsin-Madison, 1982
- M.A., Mathematics, University of Wisconsin-Madison, 1984
- Ph.D., Mathematics, University of Wisconsin-Madison, 1987
Advisor: Professor J.C. Strikwerda.

Professional Employment

- Post-doctoral Fellow, Mathematical Sciences Institute, Cornell University, 1987–89
- Assistant Professor, Department of Mathematical Sciences, University of Wisconsin–Milwaukee, 1989–1995
- Associate Professor, Department of Mathematical Sciences, University of Wisconsin–Milwaukee, 1995–2006
- Professor, Department of Mathematical Sciences, University of Wisconsin–Milwaukee, 2006–

Additional Professional Positions

- Acting Assistant Professor, Department of Mathematics, Cornell University, 1987–89
- Visiting Professor, Dept. of Mathematics, Statistics and Computer Science, Marquette University, 1998

- Founder & Director, Center for Industrial Mathematics, University of Wisconsin–Milwaukee, 1998–
- Profesor Visitante, Departamento de Matemática Aplicada, Universidad de Salamanca, Spain, 2005
- Associate Chair, Department of Mathematical Sciences, University of Wisconsin–Milwaukee, 1998–2001 & 2005–

Grants Received

1. Co-PI, *Nonlinear PID Control for the Paper Industry*, University of Wisconsin System Applied Research Grant, July 1, 1999— June 30, 2000, \$34,303. Supporting funds of \$27,000 provided by Rockwell Automation, Inc (with B.A. Armstrong).
2. Co-PI, *Singular Control of Stochastic Processes: Probabilistic Foundations and Numerical Methods*, National Security Agency (NSA), \$77,000, December, 2004 - August, 2007, #H98230-05-1-0062 (with R. Stockbridge).
3. PI, *Numerical Solution of Multi-Dimensional Reaction-Diffusion Equations and Numerical Foundations for Stochastic Processes*, Ministerio de Educación, Cultura y Deporte, España, €31,200 (\$37,440), 2005, #SAB2003-0266 (with J. Vigo-Aguiar, Universidad de Salamanca).
4. Senior Associate, *Técnicas Numéricas i£;Adaptadas i£;al Cálculo de Orbitas de Satélites Artificiales y a la Generación de Lluvia Artificial*, Ministerio de Educación, Cultura y Deporte, España, \$35,000, 2005, #MTM-2005-04007 (with J. Vigo-Aguiar).

Refereed Publications (Periodicals and Proceedings)

Published and Accepted Articles, Refereed Journals and Refereed Proceedings

1. *An Extension of the Kreiss Matrix Theorem* (with J.C. Strikwerda), SIAM Journal on Numerical Analysis, V. 25, 1988, pp. 1272-1278.

2. *Regularity Estimates up to the Boundary for Elliptic Systems of Difference Equations* (with J.C. Strikwerda and K.P. Bube), *SIAM Journal on Numerical Analysis*, V. 27, 1990, pp. 292-322.
3. *Symmetrizable Finite Difference Operators*, *Mathematics of Computation*, V. 54, 1990, pp. 525-543.
4. *Cesàro Means and the Kreiss Matrix Theorem* (with J.C. Strikwerda), *Linear Algebra and Its Applications*, V. 145, 1991, pp. 89-106.
5. *Convergence of Galerkin Finite Element Schemes for Nonhomogeneous Parabolic Evolution Problems* (with K. Jayasuriya), *Journal of Mathematical Analysis and Applications*, V. 195, 1995, pp. 645-657.
6. *A Survey of the Kreiss Matrix Theorem for Power Bounded Families of Matrices and Its Extensions* (with J.C. Strikwerda), in *Linear Operators, Banach Center Publications*, Polish Academy of Sciences, Institute of Mathematics, J. Janas, F. Szafraniec, and J. Zemánek, eds., Warsaw, V. 38, 1997, pp. 339–360.
7. *The Weighted Continuous Galerkin Method*, (with Maha Nabhan), *IMACS 1997: Iterative Methods in Scientific Computation*, Proceedings of the Third IMACS International Symposium on Iterative Methods in Scientific Computation, Jackson Hole, Wyoming, July 9-12, 1997, J.P. Wang, M.B. Allen III, B.M. Chen, and T. Mathew, eds., Volume 4 in the IMACS Series on Computational and Applied Mathematics, 1998, pp. 295–300.
8. *Nonlinear PID Control with Partial State Knowledge: A Generation Method Based on Quadratic Programming*, (with B. Armstrong), Proceedings of the American Control Conference, Chicago, Illinois, June, 2000, pp. 774– 778.
9. *The Weighted Continuous Galerkin Scheme for Ordinary Differential Equations*, (with M. Nabhan), *International Journal of Computer Mathematics*, V. 76, no. 1-2, 2000, pp. 323–337.
10. *Modeling the Active Magnetic Regenerator*, (with D. H. Schultz and B. Siddikov), Proceedings of the IMACS International Conference on Scientific Computing and Mathematical Modeling, (IMACS 2000, Milwaukee, WI), Institute for Applied Science and Computations, May, 2000, pp. 55–59.

11. *Nonlinear PID Control with Partial State Knowledge Damping without Derivatives*, (with B. Armstrong), International Journal of Robotics Research, V. 19, no. 8, August, 2000, pp. 715–731.
12. *A Non-Overlapping Implicit Predictor-Corrector Scheme for Parabolic Equations* (with D. S. Daoud and A.Q.M. Khaliq), Proceedings of the International Conference on Parallel and Distributed Processing Techniques and Applications, PDPTA 2000, June 24-29, 2000, Las Vegas, Nevada, USA, H.R. Arabnia et al, ed., V. I (ISBN 1-892512-22-x), CSREA Press, pp. 15–19, 2000.
13. *A Two-Stage Multi-Splitting Method for Non-Overlapping Domain Decomposition for Parabolic Equations*, (with D.S. Daoud), Domain Decomposition Methods in Sciences and Engineering (DDM), T. Chan, T. Kako, H. Kawarada, and O. Pironneau, eds., 2001, ISBN No. 4-901404-00-8, pp. 101–108.
14. *On Smoothing of the Crank-Nicolson Scheme for Nonhomogeneous Parabolic Problems*, (with A.Q.M. Khaliq) Journal of Computational Methods in Sciences and Engineering (JCMSE), V. 1, no. 1, 2001, pp. 107–124.
15. *The Stability of Nonlinear PID Control with Arbitrary Partial-State Knowledge*, (with B. Armstrong, J. A. Gutierrez and R. Joseph), Proceedings of the 2002 IEEE International Conference on Robotics and Automation, ICRA 2002, May 11-15, 2002, Washington, DC, USA, V. 4, 2002, pp. 3429-3434.
16. *Numerical Simulation of the Passive Regenerator*, (with B. Siddikov and D.H. Schultz) International Journal of Applied Science and Computations, V. 9, no. 2, 2002, pp. 89–97.
17. *Optimal NPID Stabilization of Linear Systems*, (with I. Lauko and B. Armstrong), Journal of Optimization Theory and Applications, V. 124, No. 2, 2005, pp. 307–322.
18. *Numerical Simulation of the Active Magnetic Regenerator*, (with B. Siddikov and D. Schultz), Computers and Mathematics with Applications, V. 49, 2005, pp. 1525-1538.
19. *On the Smoothing of the Crank-Nicolson Method for Pricing Barrier Options*, (with A.Q.M. Khaliq, M. Yousuf, J. Vigo-Aguiar, & R. Deininger), V-

Proceedings of the CMMSE 2005, J.Vigo-Aguiar & B.A. Wade, eds., ISBN No. 84-609-4844-7, V. 1, 2005, pp. 279–290.

20. *Numerical Solution of Parabolic Problems by Adapted BDF Algorithms*, (with J. Martín-Vaquero & J. Vigo-Aguiar), V - Proceedings of the CMMSE 2005, J.Vigo-Aguiar & B.A. Wade, eds., ISBN No. 84-609-4844-7, V. 1, 2005, pp. 364–389.
21. *Stochastic Methods for Dirichlet Problems*, (with J. Vigo–Aguiar and R. Ardanuy–Albajar), Journal of Mathematical Modeling and Algorithms (JMMA), (Online) DOI: 10.1007/s10852-005-9007-0, Volume 4, Number 3, November 2005 Pages: 317 - 330.
22. *Smoothing with Positivity–Preserving Padé Schemes for Parabolic Problems with Nonsmooth Data*, (with A.Q.M. Khaliq, M. Siddique, and M. Yousuf), Numerical Methods for Partial Differential Equations, Wiley Interscience, V. 21, No. 3, 2005, (DOI 10.1002/num. 20039), pp. 553–573.
23. *Optimization of a Gene Analysis Application* (with K. Ghosh and P. Tonelato), Computing Letters (CoLe), V. 2, No. 1, 2006, pp. 74–96.
24. *On Smoothing of the Crank-Nicolson Scheme and Higher Order Schemes for Pricing Barrier Options* (with A.Q.M. Khaliq, M. Yousuf, J. Vigo-Aguiar, and R. Deininger), Journal of Computational and Applied Mathematics (JCAM), V. 204, No. 1, July, 2007, pp. 144-158.
Internet: doi:10.1016/j.cam.2006.04.034, www.sciencedirect.com/science/
25. *Adapted BDF Algorithms Applied to Parabolic Problems* (with J. Martín-Vaquero & J. Vigo-Aguiar), Numerical Methods for Partial Differential Equations, V. 23, No. 2, pp. 350-365, 2007.
26. *Stability of Phase-Based Gain Modulation with Designer-Chosen Switch Functions*, (with B. Armstrong, J.A. Gutierrez, and R. Joseph), International Journal of Robotics Research, V. 25, No. 8, August, 2006, pp. 781–796.
27. *Smoothing with VSVO BDF Schemes for Parabolic Problems with Nonsmooth Data*, (with J. Martín-Vaquero), Proceedings of the 2006 Conference on Computational and Mathematical Methods in Science and Engineering (CMMSE 2006), V. 2, 2006, pp. 706–711, (ISBN 84-611-1090-0; 978-84-611-1090-2).

28. *High Order Smoothing Schemes for Inhomogeneous Parabolic Problems with Applications to Nonsmooth Payoff in Option Pricing* (with A.Q. M. Khaliq, M. Yousuf, and J. Vigo-Aguiar), *Numer. Methods for Partial Differential Equations (NMPDE)* V. 23(5), 2007, 1249–1276.
29. *Numerical Solution of a Long-term Average Control Problem for Singular Stochastic Processes*, (with P. Kaczmarek, S.T. Kent, G.A. Rus, and R.H. Stockbridge), *Mathematical Methods of Operations Research (Math Meth Oper Res)*, V. 66, 2007, 451–473.
30. *Smoothing Schemes for Reaction-Diffusion Systems with Nonsmooth Data*, (with A.Q.M. Khaliq, J. Martín-Vaquero, and M. Yousuf,) to appear, *J. Comput. & Appl. Math (JCAM)*. DOI 10.1016/j.cam.2008.01.017.

Unpublished Research

1. (Ph.D.) *Stability and Sharp Convergence Estimates for Symmetrizable Difference Operators*, Ph.D. Dissertation, August, 1987.
2. *Analysis of the Telephone Queue System for Funway Holidays Funjet*, Technical Report No. 6, 1991–92 Academic Year, Department of Mathematics, University of Wisconsin–Milwaukee, 1991 (Industrial Consulting).

Invited Lectures

1. Numerical Analysis Colloquium, Department of Mathematics, Cornell University, 1988. Title: *VSVO-BDF-Galerkin Finite Element Methods*.
2. Numerical Analysis Colloquium, Department of Computer Sciences, University of Wisconsin—Madison, 1990. Title: *The Numerical Solution of Parabolic Equations: Some Problems*.
3. *Semester on Linear Operators, II*, Stefan Banach Center, Institute of Mathematics, Polish Academy of Sciences, Warsaw, Poland, February, 1996. Title: *The Kreiss Operator Theorem and Numerical Range Mapping Theorems, With Applications to Numerical Analysis*.

4. *Semester on Linear Operators, II*, Stefan Banach Center, Institute of Mathematics, Polish Academy of Sciences, Warsaw, Poland, February, 1996. A second lecture, given later in the same conference by special invitation after the first lecture: Title: *Numerical Range Mapping Theorems and Resolvent Estimates*.
5. *Fifth International Conference on Evolution Equations and Their Applications to Technology*, Hiroshima, Japan, October, 1996. Title: *Finite Element Methods for Evolution Equations*.
6. *Third IMACS International Symposium on Iterative Methods in Scientific Computations*, Jackson, Wyoming, July, 1997. Title: *Weighted Galerkin Methods for Evolution Equations*.
7. *International Conference on Operator Theory and Its Applications to Scientific and Industrial Problems*, Winnipeg, Manitoba, Canada, October, 1998. Title: *Finite Element Schemes in Time for Evolution Equations*.
8. Colloquium, Department of Mathematics, Statistics and Computer Science, Marquette University, November, 1998, *Numerical Analysis for Evolution Problems*.
9. International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'2000), Las Vegas, Nevada, June, 2000. Title: *A Non-Overlapping Implicit Predictor-Corrector Scheme for Parabolic Equations*.
10. Colloquium, Department of Mathematics, Western Illinois University, October 2000 *Nonlinear PID Control with Partial State Knowledge*.
11. *Some New Damping Schemes for Parabolic Problems with Nonsmooth Data*, at the *Midwest Numerical Analysis Day*, Western Illinois University, April, 2003.
12. *Smoothing Schemes for Parabolic Problems with Nonsmooth Data & Applications*, Centro Andaluz del Medio Ambiente (CEAMA), Universidad de Granada, Granada, Spain, June 1, 2005.
13. *The Crank-Nicolson Scheme and Higher Order Schemes for Pricing Barrier Options*, Computational and Mathematical Methods in Science and Engineering, Alicante, Spain, June 28, 2005.

14. *Smoothing with VSVO BDF Schemes for Parabolic Problems with Nonsmooth Data*, at the International Conference on Computational and Mathematical Methods in Science and Engineering (CMMSE 2006), Madrid, Spain, September 22, 2006.

Editorship

1. Co-editor, *Special Issue on Computational Fluid Dynamics*, International Journal on Applied Science and Computations, 1996-1998.
2. Editorial Board Member (Mathematics and Engineering and Computer Science Section), *Journal of Computational Methods in Science and Engineering*, Cambridge International Science Publishing, 2000—2006.
3. Assistant Editor, *International Journal of Applied Science and Computations*, 1999–
4. Associate Editor, *Proceedings of the IMACS International Conference on Scientific Computing and Mathematical Modeling*, (IMACS2000, Milwaukee, WI), published by the Institute for Applied Science and Computations, May, 2000.
5. Associate Editor, *Proceedings of the International Conference on Parallel and Distributed Processing Techniques and Applications, PDPTA 2000, June 24-29, 2000, Las Vegas, Nevada, USA*, V. I (ISBN 1-892512-22-x), CSREA Press, 2000.
6. Co-Editor, *Computational and Mathematical Methods in Science and Engineering, Proceedings of the 2002 Conference on Computational and Mathematical Methods in Science and Engineering (CMMSE2002)*, (with J. Vigo-Aguiar) V. 1–4.
7. Editorial Board Member, *Lecture Series on Computer Science and Computational Sciences (LSCSCS)*, VSP/Brill, 2004–2006.
8. Co-editor, *Proceedings of the 2005 Conference on Computational and Mathematical Methods in Science and Engineering, CMMSE-2005*, ISBN No. 84-609-4844-7, (with J. Vigo-Aguiar).

9. Co-editor, *Proceedings of the 2006 Conference on Computational and Mathematical Methods in Science and Engineering, CMMSE-2006*, ISBN No. 84-611-1090; 978-84-1090-2 (with J. Vigo-Aguiar).
10. Editorial Board Member (Mathematics and Engineering and Computer Science Section), *Journal of Computational Methods in Science and Engineering*, IOS Press, 2006— present.
11. Guest Editor, *Special issue dedicated to Professor Shinnosuke Oharu on the Occasion of his 65th Birthday*, *Journal of Computational and Applied Mathematics (JCAM)* (with J. Vigo-Aguiar), V. 204, No. 1, July, 2007, ISBN 0377-0427.
12. Editorial Board Member, Section B— Computational Methods: Applications, *International Journal of Computer Mathematics (IJCM)*, 2006 — .
13. Editor, *Proceedings of the 2007 International Conference on Computational and Mathematical Methods in Science and Engineering* , June, 2007, ISBN 978-84-690-6887-8.
14. Guest Editor, *Special issue: Recent Advances in Computational and Applied Mathematics in Science and Engineering* (with J. Vigo-Aguiar), *Int. J. of Computer Mathematics*, V. 85, Nos. 3-4, march-April, 2008, ISBN 0020-7160, Taylor and Francis Group.

Scientific Committees and Chairmanships

1. Chair, *Midwest Numerical Analysis Day*, research conference, April, Milwaukee, Wisconsin, 1995.
2. Chair, special session: *Finite Element Methods with Applications*, at *Third IMACS International Symposium on Iterative Methods in Scientific Computations*, Jackson, Wyoming, July, 1997.
3. Local Chair, American Mathematical Society Central Sectional Meeting, at the University of Wisconsin—Milwaukee, October, 1997.
4. Co-organizer, IMACS International Conference on Scientific Computing and Mathematical Modeling, May 25-27, 2000, at the University of Wisconsin—Milwaukee.

5. Co-Chair, Special Session, *Parallel and Sequential Algorithms for Numerical Solution of Ordinary and Partial Differential Equations*, at *International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA'2000)*, Las Vegas, Nevada, June, 2000.
6. Scientific Advisory Board, *Second M.I.T. Conference on Computational Fluid and Solid Mechanics*, June, 2003, at the Massachusetts Institute of Technology.
7. Co-Chair, Special Session, *Multiscale Computations in Fluid and Solid Mechanics* (with B. Diskin, NASA-ICASE), at the *Second M.I.T. Conference on Computational Fluid and Solid Mechanics*, June, 2003.
8. Co-Chair, Special Session, *Recent Advances in Analysis and Numerics for Fluid Dynamics Problems* (with H. Liu, Iowa State University), at the *Second M.I.T. Conference on Computational Fluid and Solid Mechanics*, June, 2003.
9. Scientific Committee, *International Conference of Computational and Mathematical Methods in Science and Engineering, ICMMSE2003*, Kastoria, Greece, June, 2003.
10. Chair, *Midwest Numerical Analysis Day*, research conference, April, Milwaukee, Wisconsin, 2004.
11. Scientific Committee, *Computational and Mathematical Methods in Science and Engineering, CMMSE2004*, Uppsala, Sweden, June, 2004.
12. Ph.D. Tribunal Committee Member, *Problemas de Valores Iniciales de Segundo Orden de Tip Oscilatorio* (H. Ramos-Calle), Departamento de Matemática Aplicada, Universidad de Salamanca, July 12, 2004.
13. Ph.D. Tribunal Committee Member, *Mejora de las Probabilidades de Pertenencia en Clasificación Difusa con Aplicación al Cálculo Preciso de Órbitas* (J. A. Soto Espinosa), Departamento de Matemática Aplicada, Universidad de Alicante, June 30, 2005.
14. Ph.D. Tribunal Committee Member, *Métodos Exponential Fitting y Adaptados para Problemas Stiff*, (J. Martín Vaquero), Departamento de Matemática Aplicada, Universidad Rey Juan Carlos, Madrid, Spain, February 21, 2006.

15. Chair, Special Session on *Industrial Mathematics*, at the *Conference on Computational and Mathematical Methods in Science and Engineering, CMMSE 2005*, Alicante, Spain, June 27-30, 2005.
16. Scientific Committee, *International Conference on Mathematics and Applications (ICMA-MU 2005)*, Bangkok, Thailand, December 15– 17, 2005.
17. Chair, Special Session *Numerical Solution of Ordinary Differential Equations*, *Conference on Computational and Mathematical Methods in Science and Engineering (CMMSE 2006)*, Madrid, Spain, September 21-25, 2006.
18. Chair, Special Session *Computational Mathematics*, *Conference on Computational and Mathematical Methods in Science and Engineering (CMMSE 2006)*, Madrid, Spain, September 21-25, 2006.
19. Chair, Special Session *Industrial Mathematics*, *Conference on Computational and Mathematical Methods in Science and Engineering (CMMSE 2006)*, Madrid, Spain, September 21-25, 2006.
20. Organizer & General Chair, *International Conference on Computational and Mathematical Methods in Science and Engineering (CMMS 2007)*, June 20-23, 2007, Illinois Institute of Technology, Chicago, IL.
21. Co-Founder & Co-General Chair (with J. Vigo Aguiar), *Computational and Mathematical Methods in Science and Engineering (CMMSE)*, Conference Series. Conference locations: Milwaukee, Wisconsin, USA (2000), Alicante, Spain (2002), Kastoria, Greece (2003), Uppsala, Sweden (2004), Alicante, Spain (2005), Madrid, Spain (2006), Chicago, IL, USA (2007), and Murcia, Spain (2008).
22. Scientific Board Member, *Midwest Numerical Analysis Day (MWNADAY)*, an annual regional research conference.

Graduate Thesis Supervision

Ph.D. Theses

1. Kumara Jayasuriya, *Optimal Error Estimates for Semidiscrete and Backward Euler Galerkin Finite Element Schemes for Parabolic Evolution Equations*, Ph.D., Numerical Analysis, University of Wisconsin–Milwaukee, August, 1993.
2. Sergio Loch, *Error Estimates for Semidiscrete Galerkin Finite Element Schemes for Second Order Strongly Damped Wave Equations*, Ph.D., Numerical Analysis, accepted at University of Wisconsin–Milwaukee, August, 1993.
3. Maha Nabhan, *The Weighted Continuous Galerkin Method for Initial Value Problems*, Ph.D., Numerical Analysis, University of Wisconsin–Milwaukee, August, 1997.
4. M. Siddique, *Smoothing with Positivity-Preserving Padé Schemes for Parabolic Problems with Nonsmooth Data*, Ph.D., Numerical Analysis, University of Wisconsin–Milwaukee, December, 2002.
5. Bahodir Siddikov, *Numerical Aimulation of the Active Magnetic Refrigerator*, (Co-advisor D.H. Schultz), Ph.D., Industrial Mathematics, University of Wisconsin–Milwaukee, May, 2001.
6. Tatiana Soleski, *Wavelets in Computerized Tomography*, (Co-advisor G. Walter), Ph.D., Industrial Mathematics, University of Wisconsin–Milwaukee, May, 2002.
7. M. Yousuf, *Smoothing with Positivity-Preserving Padé Schemes for Inhomogeneous Parabolic Problems with Nonsmooth Data*, Ph.D., Numerical Analysis, Mathematics, University of Wisconsin–Milwaukee, May, 2005.
8. I. Panayotova, *Meridional Asymmetries in Large-Scale Atmospheric Dynamical Phenomena*, (Co-advisor K. Swanson, Atmospheric Science), Ph.D., Applied Mathematics, University of Wisconsin–Milwaukee, May, 2005.

Master's Theses

9. Tatiana Golovatcheva, *Report to PPG Industries, Inc.*, Master of Science, Industrial Mathematics, University of Wisconsin–Milwaukee, December, 1997.

10. Oliver Röhrle, *Weighted Finite Difference Schemes for Evolution Problems*, Master of Science, Mathematics (Numerical Analysis), University of Wisconsin–Milwaukee, August, 1999.
11. Christoph Höft, *Modeling Ink Flow in the Industrial Print Process*, Master of Science, Industrial Mathematics, University of Wisconsin–Milwaukee, May, 1999.
12. Elizabeth Torma, *Analysis of a Viable Model and Its Implementation for Assigning Faculty to Courses and Times at the University of Michigan–Dearborn, Department of Mathematics and Statistics*, Master of Science, Industrial Mathematics, University of Wisconsin–Milwaukee, May, 2000.
13. Ruth Carlson, *Optimization of Gluing Operations Using Design of Experiments and MINITAB Software*, Master of Science, Industrial Mathematics, University of Wisconsin–Milwaukee, August, 2001.
14. Lisa Ann Walter, *Log-Logit and the Four Parameter Logistic Transformations of Immunoassays*, Master of Science, Industrial Mathematics, University of Wisconsin–Milwaukee, August, 2001.
15. Krishnendu Ghosh, *Enhancement of a Problem Solving Environment for Gene Analysis*, Master of Science, Industrial Mathematics, University of Wisconsin–Milwaukee, August, 2001.
16. Lioubov A. Mikhailova, *NPID Control with Gamma-Limiting and Arbitrary Partial-State Knowledge*, Master of Science, Industrial Mathematics, University of Wisconsin–Milwaukee, May, 2002.
17. F. Mörchen, *Analysis of Speedup as Function of Block Size and Cluster Size for Parallel Feed-Forward Neural Networks on a Beowulf Cluster*, Master of Science, Applied Mathematics, University of Wisconsin–Milwaukee, August, 2002.
18. R. Deininger, *On the Performance of Positively Smoothed Pade Schemes for Barrier Options*, Master of Science, Mathematics, University of Wisconsin–Milwaukee, December, 2004.
19. Peter Kaczmarek, *Numerical Analysis of a Long-Term Average Stochastic Control Process*, Master of Science, University of Wisconsin–Milwaukee, May, 2006.

20. Kathrin Kopp, *Higher Order Computational Methods for Asian Options*, Master of Science, University of Wisconsin–Milwaukee, May, 2006.
21. Britta Janssen, *Linearly-Implicit Methods Applied to a Chemotaxis Model*, May, 2007.
22. Theresa Springer, *Development of a Second Order Exponential Time Differencing Scheme*, May, 2008.

Major University Service & Teaching Experience

Major University Service

1. Co-Created first Departmental Web page and served as webmaster, 1995-1998.
2. Served as chair on 5 faculty hiring committees.
3. Member, Academic Policy Committee (APC), University of Wisconsin-Milwaukee, 1994-1997.
4. Chair, Applied Mathematics and Physics (AMP) Program, 1998-2001 & August, 2005-present.
5. Re-designed Mathematics and Statistics Undergraduate Majors (as the rules currently exist), Department of Mathematical Sciences, UWM, 1997.
6. Created degree Master's of Industrial Mathematics, Department of Mathematical Sciences, UWM, 1997 & 1997–present.
7. Founder & Director, Center for Industrial Mathematics, 1999-2008. (In 2008 the center was re-organized to the Center for Interdisciplinary Mathematics.)
8. Created the Ph.D. option in Industrial Mathematics, Department of Mathematical Sciences, UWM, 2000.
9. Designed and maintained two Beowulf Clusters for parallel computation, with 8 and 4 nodes, 2001-present. These are used for graduate instruction as well as Master's and Ph.D. student research in parallel computing.

10. Designed new applied/industrial math courses, Math 601 (Advanced Engineering Mathematics I), Math 602 (Advanced Engineering Mathematics II), Math 701 (Industrial Mathematics I), Math 702 (Industrial Mathematics II), Core courses for the Industrial Mathematics program, Department of Mathematical Sciences, UWM, 2003.
11. Co-Authored Department Program Review, 2007-2008.
12. Co-Founder & Primary Advisor, *Applied Mathematics and Computer Science*, (AMCS) degree, 2008–.
13. Co-Created Center for Interdisciplinary Mathematics (CIM), 2008.

Specific Courses

(Most for multiple semesters.)

000 *GEST (Gateway to Engineering and Science Technology) Pre-calculus*. On-campus instruction of high school junior minority students leading to advanced placement calculus.

095 *Essentials of Algebra*

105 *Intermediate Algebra*

109 *Mathematics for Elementary Teachers*

112 *College Algebra*

115 *Elementary Functions* (Pre-calculus). Also served as coordinator for two semesters

122 *Calculus II—Honors* (at Cornell University)

211 *Survey in Calculus and Analytic Geometry*

221 *Honors Calculus I*

222 *Honors Calculus II*

225 *Calculus with Precalculus I* Served as coordinator two years

226 *Calculus with Precalculus II* Served as coordinator two years

231 *Calculus and Analytic Geometry (I)*

232 *Calculus and Analytic Geometry (II)*

233 *Calculus and Analytic Geometry (III)*

313 *Linear Programming and Optimization*

321 *Vector Analysis*

322 *Introduction to Partial Differential Equations*

341 *Introduction to the Language and Practice of Mathematics*

405 *Mathematical Modeling*

413 *Numerical Analysis (I)*

414 *Numerical Analysis (II)*

425 *Numerical Analysis of Differential Equations (at Cornell University)*

535 *Linear Algebra*

601 *Advanced Engineering Mathematics I*

699 *Independent Study— Linear Programming*

701 *Industrial Mathematics*

702 *Industrial Mathematics*

711 *Theory of Functions of a Real Variable, I*

712 *Theory of Functions of a Real Variable, II*

726 *Introduction to Functional Analysis (graduate level)*

790 *Seminar: Numerical Analysis*

792 *Industrial Internship*

793 *Scientific Computing Laboratory*

799 *Mathematics of Fluid Mechanics*

799 *Numerical Linear Algebra*

799 *Parallel Computing with MPI*

801 *Topics in Applied Mathematics*

813 *Numerical Solution of Ordinary Differential Equations*

814 *Numerical Solution of Partial Differential Equations*

815 *Topics in Numerical Analysis: Evolution Problems*

819 *Advanced Partial Differential Equations*

990 *Reading and Research*. Multiple students and semesters. Various topics.

Address

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WWW www.uwm.edu/Dept/Math (*Department of Mathematical Sciences*)
WWW www.uwm.edu/Dept/CIM (*Center for Industrial Mathematics*)

April 24, 2008