

Joseph Kolibal

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University Education

1986 – 1990 *Oxford University* *D.Phil., Mathematics (numerical analysis), 1990*

Research for doctorate is on the numerical solution of hyperbolic partial differential equations, especially in regard to the analysis of numerical methods with applications in computational fluid dynamics analysis.

- Dissertation: *Aspects of the Finite Volume Method for Compressible Flows*. Supervisor: Prof. K. W. Morton. The research was supported through a research assistantship provided by R.A.E. Farnborough.

The studies leading to the M.Sc. qualifier focused on nonlinear elliptic partial differential equations, functional analysis and free and moving boundary problems.

- The M.Sc. qualifying dissertation: *Solutions of a Nonlinear Elliptic Boundary Value Problem with a Discontinuous Nonlinearity*. Supervisor: Dr. J. Norbury.

1980 – 1986 *Princeton University* *Continuing education*

Completed the core undergraduate mathematics curriculum: Honors multi-variable calculus, introduction to analysis, real analysis I & II, complex analysis I & II, topology I & II, odes, abstract algebra, and numerical analysis.

1979 – 1979 *Courant Institute, New York University* *Continuing education*

Completed course in advanced calculus.

1975 – 1977 *Imperial College, Univ. of London* *M.Sc., D.I.C., Nuclear Engineering, 1977*

Concentration in reactor physics and control. Research on radiation transport and computational solution methods.

- Thesis: *Variance Reduction in Monte-Carlo by Removal of the Spatial Components*. Supervisor: Dr. J. Woods.

1970 – 1974 *Carnegie-Mellon University* *B.S. Chemical Engineering, 1974*

Undergraduate research on coatings and paints with PPG Industries under Dr. Dent.

Academic Experience1993 —
Present*University of Southern Mississippi**Associate Professor, Mathematics*

Tenured and promoted Fall, 1999 in the Mathematics Department with a research focus in applied and numerical mathematics. Graduate Program Coordinator for PhD and MS program Fall 2008–present; Assistant chair, Fall 2008–present.

- Invited to teach in the International Summer School at Korea University, summer 2008; selected as a Visiting Scholar at Korea University, Seoul, South Korea, Summer of 2007.
- Developed curriculum for new doctoral program in Applied and Computational Mathematics for the Department of Mathematics, January 2004; Presently teach a comprehensive range of courses supporting the mathematics B.S. and M.S. programs, and the Applied and Computational Mathematics (ACM) Ph.D. programs in the Department of Mathematics.
- Coordinator for the College wide interdisciplinary Program in Scientific Computing, August 2002 to May 2004, responsible for developing and administering the doctoral level graduate program, and responsible for program outreach, and interfacing with Department chairs.
Taught doctoral courses in applied mathematics/computational fluid dynamics in the Program in Scientific Computing 1993–2005.
- Supervise M.S. students in mathematics and Ph.D. students in Program in Scientific Computing (to 2004) and Applied and Computational Mathematics (after 2004). Have worked with 50 students on research projects, and have supervised and successfully chaired committees for 5 doctoral students, 5 masters students, and 4 undergraduate research projects, including 2 NSF REU supported students.
- Taught four week graduate mini-course in Numerical Methods at Nanjing University for Aeronautics and Astronautics, Nanjing, PRC, June 2002.
- Awarded NASA-ASEE Summer Faculty Fellowships in 1994 and 1995 to study modeling of chemically reacting flows in rockets involving finite rate chemistry.

1991 – 1993

*University of Florida**Assistant Professor, Mechanical Engineering*

Two year (non-tenure track) position from August 1991 to May 1993:

- Taught numerical analysis, engineering and computational mathematics at the graduate level at the Center for Advanced Studies in Engineering, West Palm Beach Campus. These classes were done jointly by video with UF, Gainesville.
- Supported industrially sponsored research at the Center for Advanced Studies in Engineering in combustion modeling.

1987 – 1989

*Oxford University**Tutor/Teaching Assistant*

Tutored undergraduates in mathematics while doctoral student at Oxford University (six terms for St. Hilda's College). Assisted in computer lab teaching (one term at the Oxford University Computing Laboratory).

Industrial/Research Experience

- 2006 – 2008 *QinetiQ, PLC* *Consultant*
Signal Analysis and lossy compression algorithms, primarily for image data.
- 2002 – 2003 *Synergetic Technologies, Inc.* *Consultant*
Developed mathematical models and software for support of scattering analysis associated with nano-particle spectral analysis.
- 1993 *University of Florida* *Consultant*
Three month summer semester research contract for modeling of flue gas effluent and combustion efficiency of waste incineration.
- 1990 – 1991 *Pratt and Whitney* *Senior Engineer, CFD Group*
Supported effort in three-dimensional Navier-Stokes studies of rotating machinery (engine compressor design), assessing computational fluid dynamics (CFD) software, methods and mesh generation, and assisting in the integration of computational techniques into engineering design.
- Worked on two-phase flow modeling and aircraft compressor computational fluid dynamics.
 - Responsible for assessing alternative computational methods for future development or acquisition by the CFD group.
- 1987 *Princeton Plasma Physics Laboratory* *Consultant*
Three month DOE consulting contract for analytical and software development doing transient analysis simulation of the vacuum pumping system for the Tokamak Fusion Test Reactor (TFTR).
- 1980 – 1986 *Princeton Plasma Physics Laboratory* *Technical Staff, Radiation Analysis Group*
Computational neutronics analyst for TFTR. Performed computational fusion neutronics engineering, analysis and research.
- Experience with discrete ordinates and Monte-Carlo methods, and radiation modeling.
 - Worked in Radiation Analysis Group in assessing and predicting operational and shutdown radiation fields of the Tokamak Fusion Test Reactor during Deuterium-Deuterium and Deuterium-Tritium pulse testing.
 - Developed off site dose dispersion and tritium effluent models and assessments, and nucleonics software for parametric studies.
- 1977 – 1980 *Ebasco Services, Incorporated* *Nuclear Engineer, Applied Physics Department*
Supported computational radiation analysis and design of radiation monitoring systems for nuclear power plant design.
- 1974 – 1975 *Dravo Corporation* *Chemical Engineer, ChemPlants Division*
Engineered process flow measurement and control for chemical plant design.

Funded Research*University of Southern Mississippi**Noetic Technologies, Inc.*

Submitted patent on stochastic interpolation: No. 20050203982 - Method and apparatus for approximating, deconvolving and interpolating data using Bernstein functions; currently working with Noetic Technologies to commercialize product development.

*University of Southern Mississippi**Department of Mathematics*

Awarded a total of \$196,300 in grants of which \$179,000 was in external funding. Applied for over 32 research grants, of which the following were funded:

- NRL Subcontract (Marine Sciences) for NCODA data analysis, \$6500 Summer 2008.
- USM Faculty Grant for Improvement of Education, \$3300 Summer 2008.
- USM Faculty Mentor Grant, \$2500 Spring 2006.
- NSF Research Experience for Undergraduates (REU), \$12,000 Fall 2002 - Spring 2003.
- USM Aubrey K. Lucas Grant, Developing Smooth non-Polynomial Interpolants, \$5000 Summer 2002.
- Naval Research Laboratory (NRL), Assessment of Parallel Approximation in Ocean Modeling \$5,240, Summer, 1998, Funded, Fall 1999.
- Awarded \$22,000 for Thermochemistry Modeling Study, NASA, October 1997 to September, 1998.
- Awarded \$11,000 for NASA-ASEE Faculty Fellowship, June to August, 1995.
- Awarded \$22,000/year for 3 years for NASA Graduate Research Assistantship, August, 1994.
- Awarded \$25,000 by NASA for SSME Diffuser Thermochemistry/CFD Modeling Study.
- Awarded \$41,000 for seed-funding support for cavitation modeling for one year from NASA.
- Awarded \$11,000 for NASA-ASEE Fellowship, June to August, 1994.

Funded Education Grants*University of Southern Mississippi**Department of Mathematics*

Sought support for the improvement of education and pedagogy through ten grants submitted, including 5 major proposal (IGERT, ILI Instrumentation Grant, Eisenhower Grant, and two US DoEd FIPSE Grants). The following were funded:

- USM Summer Grant for the Improvement of Instruction, Development of Online, Interactive Calculus Text and Software, 1/3 Summer Semester support, 2008.
- USM Collaborative Technology Infusion Team Awards (PT3/CTI), \$2500 to develop an interactive web site to teach and learn elementary statistics and probability concepts, Summer 2001.
- Summer Grants for the Improvement of Education, 1999. Internal grant support with 2/3 summer salary award.
- Pittsburgh Supercomputing Center, Spring, 1996. Obtained support for parallel computing research into two-phase flows on PSC Cray T3D.

Teaching

Have taught over 95 classes from Fall of 1993 to present (Spring of 2010) at USM, primarily in support of the Scientific Computing (SC) Program, and the upper divisional and Masters Mathematics program. With the newly formed Ph.D. in Applied and Computational Mathematics (ACM) offered since 2005 through the Department as part of the College's Computational Science Program (COS), the graduate teaching shifted from SC to ACM as part of COS.

While most of the teaching at USM has been at the upper divisional and graduate levels because of need, I have maintained a consistent effort to improve educational effectiveness at all levels including the teaching of over 14 new courses, and an effort to improve Departmental effectiveness at the remedial and entry levels through the introduction of new approaches for teaching, having volunteered to try alternative teaching styles for MAT 101 College Algebra and MAT 103 Trigonometry. Taught classes using video feed, interactive video, and video taped lectures. Developed curricula for online courses (WebCT), and maintain active online web based curriculum support.

Actively worked on several projects to improve the curriculum, including University supported summer improvement grants in education. Most recently, Spring 2009 – present, have participated on departmental committee to re-assess the College core, introducing MAT 100 Quantitative Analysis as an alternative to College Algebra for non-STEM majors.

Doctoral classes

Taught: MAT-772 Mathematics I for Computational Science, SC-720 Mathematics I (Numerical Analysis for Scientific Computing), SC-721 Mathematics II (Numerical Solution of PDEs for Scientific Computing), SC-750 Computational Fluid Dynamics, SC 751 Introduction to the Finite Element Method, SC 740 Graduate Seminar for Scientific Computing, COS 702 Data Analysis Tools, COS 781 Numerical Linear Algebra for the Applied Sciences, and COS 781 Computational Methods for Radiation Analysis.

Upper level and masters classes

Taught: MAT-423/523 Modern Algebra I, MAT-426/526 Linear Algebra II, MAT-460/560 Numerical Analysis I, MAT-461/561 Numerical Analysis II, MAT-441/541 Advanced Calculus I, MAT-442/542 Advanced Calculus II, MAT-689, Graduate Seminar I (Inequalities, Estimation and Approximation), and MAT-689 Graduate Seminar II (Convergence).

New topics courses introduced: MAT-492: Numerical Solution of PDEs, MAT-492: Iterative Solution of Linear Systems, MAT-592: Transport theory, MAT-682: Hilbert Space Theory, MAT-684: Matrix Analysis, MAT-684: Stochastic Matrices, MAT-685: Special Functions, and MAT-685: Numerical Approximation and Interpolation.

Undergrad classes

Taught: MAT-101 College Algebra, MAT-103 Trigonometry, MAT-128 Pre-Calculus, MAT-167 Calculus I, MAT-168 Calculus II, MAT-169 Calculus III, MAT-314 Calculus for the Arts and Social Sciences, MAT-320 Probability I, MAT-321 Probability and Statistics II, MAT-326 Linear Algebra I, MAT-340 Discrete Math, MAT-415 Ordinary Differential Equations II, and MAT-417 Introduction to Partial Differential Equations.

Summer teaching

Maintain active participation in teaching during the summer semesters, primarily providing topics classes and research classes for graduate students.

Teaching (continued)*Invited classes*

Invited during the summer of 2002 to teach a graduate level mini-course on Numerical Analysis at Nanjing University for Aeronautics and Engineering in Nanjing, China; and most recently in 2007, I was selected to participate as a Visiting Scholar at Korea University, and provided a one semester course in Applied Mathematics during the summer semester. Invited in 2008 to teach two undergraduate engineering math classes at Korea University: an introductory class on numerical methods IEE-109 Numerical Analysis for Engineering, and IEE-108 Engineering Mathematics II.

Engineering teaching

Prior to USM, taught over 10 courses in graduate engineering mathematics at the University of Florida, including courses in fluid dynamics, computational fluid dynamics, numerical analysis, engineering analysis, and heat transfer.

Graduate courses taught at the Center for Advanced Studies in Engineering at the University of Florida included: EML-5710 Computational Fluid Dynamics, EML-6154 Conduction Heat Transfer, EML-6716 Advanced Fluid Dynamics, EML-6712 Advanced Computational Fluid Dynamics, EML-6934 Methods of Engineering Analysis, and EML-6934 Numerical Analysis,

Teaching aligned to research*Doctoral committees*

Presently member of one Ph.D. committee. Served on 32 doctoral committees, of which 8 were as chair; of these 8 students 5 successfully completed the research and were awarded the Ph.D. in Scientific Computing. Served on 1 doctoral committee in Mathematics Education.

Masters committees

Served on 14 masters degree committees (thesis option), of which 8 were as chair; of these 8 student 7 completed the thesis successfully and were awarded the M.S and one earned the degree without completing the thesis option on the MS research. Masters committees include those in Scientific Computing, Mathematics, and Computer Science.

Bachelors committees

Presently chair one Honors College committee (BS research degree). Served on 8 undergraduate research (thesis option, or project) committees of which 7 were as chair; of these 7 students all earned a BS with 4 of these successfully completing the research work.

Teaching aligned to service*Student mentoring*

Work with AGEM and McNair Scholars Program from 1999 to present; participated in Dean's Student Mentor Program from 1996–2001. Introduced and successfully chaired four High School Math Olympiads from 1998 to 2001 sponsored by NASA Space Grant Funds and USM.

Service

Active in supporting Departmental governance and contributing extensively to the service needs of the Department and the College of Science and Technology, particularly in support of the doctoral program, computational mathematics, and computing technology support and outreach in education. Service highlights for the last five years include:

- Department* Assistant chair, Fall 2008 – present. Responsible for day-to-day departmental duties, attending college-wide administrative meetings in absence of chair, meeting visitors and arranging schedules, and meeting with students. Also responsible for development of computing resources, and for purchases of all technology related equipment. Responsible for coordinating student and staff support for computers and technology services, and for maintaining Department web pages, brochures and public announcements. Responsible for class scheduling and graduate program development, and for coordinating the assessment and accreditation requirements the graduate programs, i.e., MS in Mathematics and PhD in Computational Science.
- Graduate Coordinator, Fall 2008 – present, responsible for the MS and PhD graduate programs. Chair, Graduate Program Committee, Fall 2007, responsible for revising the MS Graduate curriculum.
- Have extensively served on several dozen search committees in the Department of Mathematics, in the Department of Computer Science, and in the Program in Scientific Computing. Most recently served as:
- Chair, mathematics faculty Search Committee, Spring 2009 for 2 candidates; Spring 2005 for 2 candidates. Member faculty Search Committees: Spring 2004 and 2002; member Graduate Program Committee, 2002–2006.
- Graduate Computational Lab Coordinator, 2005–Present; and, Supervisor for the Computational Mathematics Laboratory, 2006–Present. Manage and administer the Department's network of 12 graduate/faculty Unix workstations and parallel computer, and supervise student computing systems support. Supervise Department web pages and documentation, 2002–Present;
- College* Member of the College of Science and Technology Dean's Search Committee, Fall 2009. Computational Science Curriculum Committee, Fall 2005–2009. College By-Laws Committee, Fall 2003–Spring 2004; Department of Computer Science Gulf Coast Faculty Selection Committee, Fall 2003. Coordinator for the Program in Scientific Computing (SC), 2002–2004, managing College-wide interdisciplinary doctoral program involving over 20 Ph.D. students at the Hattiesburg campus and at the Center for Higher Learning at NASA Stennis.
- University* Member of the University Priorities Committee, Spring 2010. Elected to Academic Council, Fall 2005–Spring 2006.
- Regional* Serve on the Open Source Software Institute (OSSI) Advisory Committee, Fall 2003–Present; Most recently: Program Committee, Frontiers in the Convergence of Bioscience and Information Technologies, FBIT 2007. Vice-Chair of the Mathematics, Computer Science, and Statistics Section of the Mississippi Academy of Sciences, 2007–2008, and Chair from 2006–2007. Chair of committee on professional opportunities in mathematics, MAA Annual Meeting, April, 2005;

Computational Background

Systems

Extensive experience on Linux and Unix platforms. Presently responsible for the Computational Mathematics Laboratory used by computational science graduate students and faculty in the Department of Mathematics, including the development of virtualization of the desktop for remote access. Maintain and provided systems support for network twelve workstations in the Department, including parallel processing using OpenMP.

Faculty adviser to the USM Linux Users Group (Student Organization), 1999 to present.

Scientific Computing

Experienced with large radiation transport codes including Monte Carlo and discrete ordinates methods; large computational fluid dynamics codes using finite difference, finite volume, and finite element methods; and, mesh generation. Experienced with image file formats, interpolation, approximation and compression tools for image file manipulation.

Comprehensive experience in large scale computing and high performance computing environments, particularly in support of industrial and engineering models.

Programming Skills

Program in Fortran, C, with extensive knowledge of scripting languages, e.g., bash, zsh and perl.

Experienced with symbolic algebraic tools Maple, Mathematica, Sage, and mathematical software libraries for computer graphics and linear algebra.

Extensive knowledge of TeX and LaTeX and electronic publication developing style files and templates for conferences, proceedings, and texts, and have developed the standard LaTeX dissertation and thesis templates used by the Scientific Computing Program, the Department of Mathematics, the Computational Science program within the College of Science and Technology, and the Honors College. Support Departmental web services and educational outreach, along with developing programs for distance learning.

Presentations

Have given over 48 local, state, national and international presentations since 1991, including most recently:

- *Stochastic Data Reconstruction*, International Conference on Computational and Experimental Engineering and Sciences, ICCES-2008, Honolulu, HI, March 16-22, 2008.
- *Interpolation a Review and a New View*, Korea University, Workshop at the Intelligent Signal Processing Laboratory, Department of Electrical Engineering, July 20, 2007.
- *Stochastic Data Reconstruction*, School of Computer Science and Engineering, Seoul National University, July 6, 2007.
- *Stochastic Data Reconstruction*, Seoul National University, Structural Complexity Laboratory, Department of Computer Science and Engineering, June 29, 2007.
- *The Use of Limiters in Stochastic Interpolation*, Mississippi Academy of Sciences Annual Meeting, Starkville, MS, February 21-23, 2007.
- *Driven Diffusion*, The Department of Physics, University of New Orleans, January 31, 2007.
- Tutorial session with D. Howard at the IEEE IHH-MSP 2006, the Second International Conference on Intelligent Information Hiding and Multimedia Signal, December 17-20, 2006, Pasadena, CA.

Publications

Publications in Preparation or Submitted

- [1] J. Kolibal, *Numerical Solution of Partial Differential Equations*. **In preparation for:** Prentice Hall.
- [2] C. Jiang, J. Kolibal, and T. Jiang, "A new numerical method for one-dimensional time-dependent Schrödinger equation using radial basis functions," *Computers and Mathematics with Applications*, Submitted, September 2009.
- [3] G. Yao, J. Kolibal, and C. Chen, "A localized approach for the method of approximate particular solutions," *Computational Mechanics*, Submitted, January 2010.
- [4] C.-H. Tsai, D. Young, and J. Kolibal, "An analysis of backward heat conduction problems using the time-dependent method of fundamental solution," *International Journal of Heat and Mass Transfer*, Submitted, January 2010.

Refereed Publications

- [1] D. Howard, A. Brezulianu, and J. Kolibal, "Genetic programming of the stochastic interpolation framework: Convection diffusion equation," *Soft Computing*, Springer, 2009. DOI: 10.1007/s00500-009-0520-3.
- [2] D. Howard, J. Kolibal, and A. Brezulianu, "Engineering presentation of the stochastic interpolation framework and its applications," *Soft Computing*, Springer, 2009. DOI: 10.1007/s00500-009-0517-y.

- [3] J. Kolibal and R. Bidaux, "Driven diffusion in solid media: a matrix formalism," *Journal of Physics A*, vol. 5, no. 42, p. 055201, 2009. DOI: 10.1088/1751-8113/42/5/055201.
- [4] J. Ding, J. Kolibal, and N. Rhee, "Integral and non-negativity preserving Bernstein-type polynomial approximations," *International Journal of Computer Mathematics*, 2008.
- [5] J. Kolibal and D. Howard, "Alternative parametric boundary reconstruction method for biomedical imaging," *Journal of Biomedicine and Biotechnology*, vol. 2008, p. 7, 2008. DOI: 10.1155/2008/623475.
- [6] J. Kolibal and D. Howard, "MALDI-TOF baseline drift removal using stochastic Bernstein approximation," *EURASIP Journal on Applied Signal Processing, Special Issue on Advanced Signal Processing Techniques for Bioinformatics.*, vol. 2006, pp. 1–9, 2006. DOI: 10.1155/ASP/2006/63582.
- [7] J. Kolibal, "Level set method for solving Poisson's equation with discontinuous nonlinearities," *Electronic Journal of Differential Equations*, vol. 2005, no. 132, pp. 1–12, 2005.
- [8] J. Kolibal and D. Howard, "Solution of differential equations with genetic programming and stochastic Bernstein interpolation," vol. <http://www.genetic-programming.org/hc2005/cfe2005.html>, June 2005. GECCO 2005 Conference, Washington, D.C.
- [9] J. Kolibal and J. Monde, "Fractal image error analysis," *Computers and Geosciences*, vol. 24, no. 8, pp. 785–795, 1998.
- [10] J. Kolibal, "Importance of convection and damping rates of convergence for the Lax–Wendroff method," *Siam Journal on Scientific Computing*, vol. 20, no. 4, pp. 1513–1529, 1998.
- [11] C. Saltiel and J. Kolibal, "Parallel radiative transport using a unified matrix approach," *Applied Numerical Mathematics*, vol. 25, pp. 499–509, 1997.
- [12] P. Blass, J. Dodziuk, T. J. Ford, and J. Kolibal, "A C^∞ spline construction," *Ulam Quarterly*, vol. 3, no. 2, pp. 11–17, 1996.
- [13] J. Kolibal and C. Saltiel, "Adaptive Grid Generation for the Calculation of Radiative Configuration Factor," *AIAA Journal of Thermophysics and Heat Transfer*, vol. 7, 1993.
- [14] J. Kolibal, "Extensions of Lax–Wendroff to Multicolor Schemes," *Ulam Quarterly*, vol. 1, no. 3, pp. 12–29, 1992.
- [15] L. Ku and J. Kolibal, "Radioactivation characteristics of the tokamak fusion test reactor," *Nuclear Technology/Fusion*, vol. 4, pp. 586–598, November 1983.
- [16] L. Ku and J. Kolibal, "Investigation of the transport of deuterium-deuterium fusion neutrons in thick concrete," *Nuclear Technology/Fusion*, vol. 4, pp. 69–78, July 1983.
- [17] L. Ku and J. Kolibal, "Neutronic calculations for the TFTR diagnostic penetration," *Nuclear Technology/Fusion*, vol. 2, pp. 313–331, April 1982.

Conference and Proceeding Publications

- [1] J. Kolibal and D. Howard, "Stochastic interpolation: A probabilistic view," in *BLISS-2008, Bio-inspired Learning and Intelligent Systems for Security, Edinburgh, UK*, pp. 129–135, IEEE, IEEE Press, Aug 2008.
- [2] D. Howard and J. Kolibal, "Stochastic interpolation as an approach to data regularization," p. B23, EMRS DTC, Aug 2008
http://www.emrstdtc.com/conferences/2008/downloads/conference_papers/B23.pdf.
- [3] J. Kolibal and D. Howard, "Parametric reconstruction of boundaries and surfaces for medical images," in *Proceeding of the IEEE Conference Frontiers in the Convergence of Bioscience and Information Technologies (FBIT 2007)*, pp. 508–511, IEEE, IEEE Press, Oct 2007. ISBN 0-7695-2999-2.
- [4] J. Kolibal and D. Howard, "Image analysis by means of the stochastic matrix method of function recovery," in *BLISS-2007, ECSIS Symposium on Bio-inspired Learning and Intelligent Systems for Security, Edinburgh, UK*, pp. 97–101, IEEE, IEEE Press, Aug 2007. DOI: 10.1109/BLISS.2007.3, ISBN:0-7695-2919-4.
- [5] R. Seyfarth, J. Kolibal, and D. Howard, "New mathematical method for computer graphics," in *Proceedings of 2006 International Conference on Hybrid Information Technology (ICHIT 2006). Vol I.*, (Cheju Island, South Korea), pp. 8–12, IEEE Press, Nov 11–13 2006.
- [6] J. Kolibal and D. Howard, "Novel algorithm for MALDI-TOF baseline drift removal," in *Proceeding of the IEEE CIBCB05 Conference*, IEEE, October 2005.
- [7] J. Kolibal and D. Howard, "The novel stochastic Bernstein method of functional approximation," in *Adaptive Hardware and Systems, 2006. AHS 2006. First NASA/ESA Conference on*, (Istanbul, Turkey), pp. 97–100, IEEE Press, Jun 15–18 2006. DOI: 10.1109/AHS.2006.73.
- [8] J. Kolibal and S. Lakhera, "Solving pdes using smooth interpolation methods," in *Frontiers in Applied and Computational Mathematics Conference, FACM 2005*, Center for Applied Mathematics and Statistics, NJIT, May 2005.
- [9] J. Kolibal, J. Qiao, and Y. Yang, "Fast Bernstein interpolation using block methods," in *Proceeding of the 2003 EIMS Conference*, EIMS, 2003.
- [10] J. Kolibal and G. Gong, "Modeling cavitation using adaptive method," in *Second Southern Conference on Computing, Hattiesburg*, pp. 1–16, USM, October 2000. ISBN 0-89871-395-1.
- [11] J. Kolibal and S. Fang, "Integral kernel/frequency shift algorithm for image data compression," in *Second Southern Conference on Computing, Hattiesburg*, pp. 1–7, USM, October 2000. ISBN 0-89871-395-1.
- [12] J. Kolibal and G. Pitalo, "Assessing the thermochemistry and flow of the SSME diffuser with air/nitrogen injection," in *Second Southern Conference on Computing, Hattiesburg*, pp. 1–12, USM, October 2000. ISBN 0-89871-395-1.
- [13] J. Kolibal, "Solving PDE's using a Gaussian basis," in *Second Southern Conference on Computing, Hattiesburg*, pp. 1–13, USM, October 2000. ISBN 0-89871-395-1.

- [14] M. Eckhoff, J. Kolibal, and R. Seyfarth, "C++ data structures for modelling stochastic processes," in *Second Southern Conference on Computing, Hattiesburg*, pp. 1–12, USM, October 2000. ISBN 0-89871-395-1.
- [15] J. Kolibal and S. Fang, "Parallel Bernstein interpolation in large scale models," in *First Southern Conference on Computing, Hattiesburg*, (Hattiesburg, MS), USM, December 1998. ISBN 0-89871-395-1.
- [16] J. Kolibal and M. Eckhoff, "Assessing finite element solutions to the stochastic Sturm-liouville equation," in *First Southern Conference on Computing, Hattiesburg*, (Hattiesburg, MS), pp. 1–20, USM, December 1998. ISBN 0-89871-395-1.
- [17] J. Kolibal and G. Gong, "Parallel computation of sheet cavitation," in *Eighth SIAM Conference on Parallel Processing for Scientific Computing, Minneapolis*, (Philadelph, PA), pp. 1–8, SIAM, March 14-17 1997. ISBN 0-89871-395-1.
- [18] J. Kolibal and L. Ladner, "Assessing numerical error in aggregation phenomena," *Transactions of the 61st Annual Meeting, Mississippi Academy of Sciences*, vol. MAS-97, no. 1, 1997.
- [19] J. Kolibal and M. Eckhoff, "A single element Poisson solver," *Transactions of the 61st Annual Meeting, Mississippi Academy of Sciences*, vol. MAS-97, no. 1, 1997.
- [20] J. Kolibal, "Solving pde's using an L_1 approximation of derivatives," *Transactions of the 61st Annual Meeting, Mississippi Academy of Sciences*, vol. MAS-97, no. 1, 1997.
- [21] J. Kolibal and G. Pitalo, "Numerical modeling of altitude diffusers," in *19th AIAA Advanced Measurement and Ground Testing Technology Conference*, (Washington, DC), pp. 1–10, AIAA, June 17-20 1996.
- [22] J. Kolibal and J. Monde, "Error in fractal imaging," *Transactions of the 60th Annual Meeting, Mississippi Academy of Sciences*, vol. MAS-96, no. 1, 1996.
- [23] J. Kolibal and L. Ladner, "Aggregation fractals," *Transactions 59th Annual Meeting, Mississippi Academy of Sciences*, vol. MAS-95, no. 1, 1995.
- [24] S. Liew, L. Ku, and J. Kolibal, "Shielding analysis for the horizontal X-ray imaging system on the TFTR," in *Sixth Topical Meeting on the Technology of Fusion Energy*, p. 326, ANC, March 1985.
- [25] S. Liew, L. Ku, and J. Kolibal, "The effectiveness of building wall boration in controlling the neutron population in a fusion facility," in *Sixth Topical Meeting on the Technology of Fusion Energy*, p. 469, ANC, March 1985.
- [26] L. Ku and J. Kolibal, "A study of scattered fusion neutron distributions in a bounded cell," *Transactions of the American Nuclear Society*, vol. 46, p. 635, 1984.
- [27] L. Ku and J. Kolibal, "Analysis of the major labyrinths in the test cell of the TFTR," *Transactions of the American Nuclear Society*, vol. 46, p. 623, 1984.
- [28] L. Ku and J. Kolibal, "The effects of iron beams in concrete on the fast neutron flux perturbation for fusion reactors," in *10th Symposium on Fusion Engineering*, p. 1869, 1983.
- [29] L. Ku and J. Kolibal, "Prompt radiation environment for the TFTR, Q = 1 demonstration," in *10th Symposium on Fusion Engineering*, p. 1274, 1983.

- [30] L. Ku and J. Kolibal, "Radioactive characteristics near TFTR for the Q = 1 demonstration program," *Transactions of the American Nuclear Society*, vol. 43, p. 285, 1982.
- [31] L. Ku and J. Kolibal, "A systematic investigation of material activation on the TFTR," *Transactions of the American Nuclear Society*, vol. 47, p. 167, 1982.
- [32] J. Kolibal and L. Ku, "Two dimensional scalar flux remeshing technique for tokamak nucleonics," *Transactions of the American Nuclear Society*, vol. 42, p. 514, 1982.
- [33] L. Ku, J. Kolibal, and J. Giarrusso, "Diagnostic penetration study for the TFTR," *Transactions of the American Nuclear Society*, vol. 38, no. 565, 1981.
- [34] L. Ku and J. Kolibal, "14 MeV neutron streaming through cylindrical ducts on TFTR," *Transactions of the American Nuclear Society*, vol. 39, November 1981.

Technical Reports

- [1] J. Kolibal and D. Howard, "Stochastic matrix functions for image analysis(uc)," Tech. Rep. QINETIQ/EMEA/IX/TR0700275/1.0, QinetiQ, Ltd, May 2007.
- [2] J. Kolibal and D. Howard, "Stochastic matrix functions for image compressoin(uc)," Tech. Rep. QINETIQ/D&TS/CS/TR0605474/1.2, QinetiQ, Ltd, March 2006.
- [3] J. Kolibal and D. Howard, "Signal processing for the enhanced detection of difficult targets," Tech. Rep. KI/AS/TR050740/1.0, QinetiQ, Ltd, February 2005.
- [4] J. Kolibal, "Assessment of diffuser thermochemistry using coupled computational fluid/thermal dynamics modeling," Tech. Rep. Contract SSC-139/NAS 13-564, NASA, Stennis Space Center, MS, September 1998. Contract Final Report.
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