

CURRICULUM VITA

ROBERT C. SHARPLEY

2013–2014

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EDUCATION

B.A.	Mathematics	University of Texas, Austin	1968
M.A.	Mathematics	University of Texas, Austin	1969
Ph.D.	Mathematics	University of Texas, Austin	1972

PROFESSIONAL EXPERIENCE

Distinguished Prof. Emeritus	University of South Carolina	2009-present
Research Professor	Interdisciplinary Mathematics Institute	2009–present
Director	Interdisciplinary Mathematics Institute	2007–2009
Interim Director	Research Computing & Cyberinfrastructure	2010-2013
Professor	University of South Carolina	1983–2008
Associate Professor	University of South Carolina	1978–1983
Assistant Professor	University of South Carolina	1976–1978
Assistant Professor	Oakland University	1972–1976

VISITING POSITIONS

Texas A&M University	Fall 1992
University of Wyoming	1986–1987
McMaster University	1978–1979
Louisiana State University	Summer 1972

INVITED TALKS PRESENTED

Over 40 conferences and colloquia and 30 international conferences

BOARDS AND COMMITTEES

Appointment as US NATO Representative - SET118	2007-2011
IMI Executive Committee	1999–2004; 2005–2007; 2010–present
IDR-NSF	1999-2003
Partnership in Computational Science Steering Committee	1991–1997
DOE Soil Center Advisory Committee	1995–1996
State of South Carolina EPSCoR Committee	1994–1997
South Carolina Supercomputer Network Board	1995–1998
Constructive Approximation, Editorial Board	1990-2005

RESEARCH GRANT SUPPORT

- *Model Classes, Approximation, and Metrics for Dynamic Processing of Urban Terrain Data*, R. Sharpley-PI, ARO MURI, South Carolina (lead) with Texas A&M, Virginia Tech, Princeton, Texas, UCLA, & UC-Irvine, \$3,000,000, 2009-2013.
- *Collaborative Research: An ATD Proposal: Fast Point Cloud Surface Reconstruction Algorithms*, PI, National Science Foundation & Defense Threat Reduction Agency, \$450,001, 2009-2012.
- *Phase II SBIR: Innovative Micro Air Vehicles & Control Techniques for Urban Environments*, PI, Radiance Technologies/DOD-Air Force Research Laboratory, \$187,500, 2009-2011.
- *Standards, Software and Hardware for Multiresolution Maps/Models for UAST in the Absence of A Priori World Models*, PI, Army Contracting Office White Sands/Virginia Tech, \$130,485, 2008-2011.

- *Model Classes, Approximation, and Metrics for Dynamic Processing of Urban Terrain Data*, R. DeVore-PI, R. Sharpley co-PI, ARO MURI, South Carolina (lead) with Texas A&M, Virginia Tech, Princeton, Texas, UCLA, & UC-Irvine, \$2,000,000, 2007-2009.
- *Mathematical Modeling, Simulation and Analysis of Vascular Biofabrication*, PI, NSF EPSCoR RII Track I, \$225,670, 2008-2009.
- *Software for Generating Geometrically and Topologically Accurate Urban Terrain Models Using Implicit Methods*, PI, ARO Phase II STTR with Radiance Technologies, \$300,000, 2007-2009.
- *Computational Foundation for Investigations in Capturing Sparsity in High Dimensions*, R. DeVore-PI, R.Sharpley/P. Binev co-PIs, ONR DURIP, \$111,624, 2008-2009.
- *Phase I SBIR: Innovative Micro Air Vehicles & Control Techniques for Urban Environments*, PI, Wright-Patterson AFRL, SBIR with Radiance Technologies, \$10,000, 2008.
- *Super-Resolution of Infrared Imagery from Video*, Radiance Technologies and U.S. Army, \$37,999, 2008.
- *Multiresolution Methods for Vision-Based Guidance, Navigation and Control*, R. Sharpley-PI, (AFOSR/Florida-lead institution together with CMU, USC, Virginia Tech), USC-\$600,000, 2003-2008.
- *Compression of Large Data Sets with Geometry*, R. DeVore/R. Sharpley PI's (DoD/ONR), \$500,000 plus \$137,348 State EPSCoR match, 2003-2007.
- *Advanced Mathematical Methods for Processing Large Data Sets*, R. DeVore-PI, P. Binev/R.Sharpley co-PI's, (DOD/ARO), \$700,000 plus \$349,999 State EPSCoR match, 2005-2008.
- *Software for Generating Geometrically & Topologically Accurate Urban Terrain Models Using Implicit Methods*, PI, R. DeVore co-PI, ARO Phase I STTR w. Radiance Technologies, \$46,999, 2006-2008.
- *Smooth Piecewise-polynomial Terrain Representation Using Non-traditional Metrics*, (DeVore/Sharpley) (DoD/ARO-STTR), Subcontract with Schafer Corporation, \$45,000, 2004.
- *Highly Effective Geospatial Representation and Analysis*, R. DeVore-PI, P. Petrushev/R. Sharpley co-PIs, (DARPA/NGA), \$461,374, 2005-2006.
- *Mathematical Analysis for Data and Image Processing in an Integrated Computational Environment*, (R. DeVore (PI), co-PI R.Sharpley) (DURIP/ONR) , \$71,235 plus \$27,229 University match, 2004-2005.
- *Achieving National Prominence In Computational Science & Mathematics*, (R.DeVore (PI), co-PI's R.Sharpley and C.Bennett) (USC VP for Research Grant with Dean's match), \$210,000, 2001-2002.
- *Development of a Multiresolution Digital Elevation Framework (with cultural attributes) for Demonstration of Emergency Response/Defense for SC*, (R.DeVore-PI, co-PI's R.Sharpley and P. Petrushev) (VP for Research/College Grant) \$50,000, 2001-2002.
- *Rapid Approximation, Registration And Rendering Of Digital Terrain Elevation Data In An Immersive Environment*, (R. DeVore/R. Sharpley PI's) (DURIP/ONR) \$144,205, 2001-2002.
- *Image Processing for Digital Terrain Elevation Data*, (R. DeVore/R. Sharpley PI's) (DoD/ONR), \$449,997 plus \$128,951 State EPSCoR match, 2000-2003.
- *Advanced Wavelet Methods for Image and Signal Processing*, (R. DeVore-PI, co-PI's Sharpley and others) (DoD/ONR), \$449,997, 1999-2002.
- *Scientific Computing Research Environments for the Mathematical Sciences*, PI (with 7 co-PI's) (NSF), \$44,741, 2000-2001.
- *Highly Nonlinear Algorithms for Wavelet Based Image Processing with Military Applications*, (PI-R. DeVore, co-PI's Sharpley and H. Wang) (DOD/DURIP), \$168,887, 1998-1999.
- *Highly Nonlinear Algorithms for Wavelet Based Image Processing with Military Applications*, (PI-Ronald DeVore, co-PI's Sharpley and others) (DOD-Combat Readiness), \$440,001, 1997-2001.
- *Wavelet-Based Image Processing for Military Applications*, (PI-R. DeVore, co-PI's Sharpley and others) (DoD/ONR), \$458,825, 1997-2001.
- *A High Performance Connection for Research at the University of South Carolina*, (PI-W. Pauley, CoPI's R. DeVore/R. Sharpley) (NSF Internet II), \$350,000, 1998-1999.
- *Parallelization of a Monte Carlo EPA Composite Model with Transformation Products*, PI (Hydro-GeoLogic/EPA), \$13,875, 1997-1998.
- *Interactive Simulations on Remote Servers and Wavelet Data Compression*, PI (subaward to Univ. Florida/NASA), \$10,000, 1998-1999.
- *Ground Challenge Problems in Environmental Modeling and Remediation: Groundwater Transport*, PI

- (DOE), \$448,800, 1995–1997.
- *Digital Imaging of DNAPL Characterization*, PI (SCUREF), \$30,932, 1995–1996.
- *Partnership In Computational Science*, PI (ORNL-DOE), \$380,206, 1992–1995.
- *Partnership In Computational Science Startup*, Co-PI (DOE/Intel), \$10,000, 1993–1994.
- *Partnership In Computational Science Equipment*, (PI-P. Huray, Co-PI with R. White and C. Bennett) (DOE), \$500,000, 1991.
- *Partnership In Computational Science Equipment*, (PI-P. Huray, Co-PI) (Intel), \$739,000, 1991.
- *Industrial Mathematics Initiative EPSCoR*, (with Co-PI's C. Bennett, B. Dalhberg, R. DeVore, and B. Jawerth) (NSF/EPSCoR), \$550,000, 1992-1995.
- *Development of Improved Groundwater Simulators*, PI (DOE/SCUREF), \$475,000, 1991-1993.
- *Distributed Computing*, PI (DOE/SCUREF), \$120,000, 1992-1993.
- *Mesoscale Atmospheric Simulations for Emergency Response*, PI of Mathematics Component (DOE/SCUREF), Math-\$211,079, 1991-1994.
- *State of South Carolina Cutting Edge*, (w/ R. DeVore and B. Jawerth), \$100,000, 1990.
- Stardent Computer, (w/ R. DeVore and B. Jawerth), 1990-1991.
- Silicon Graphics, (w/ R. DeVore and B. Jawerth), 1989-1990.
- DARPA (Investigator), 1990-1993, 1994-1997.
- Office of Naval Research (Investigator), 1990-1993.
- Ardent Computer (w/ R. DeVore and B. Jawerth), 1989-1990.
- *Maximal Functions, Interpolation, and Smoothness*, PI (NSF), 1986–1988.
- *Euclidean Harmonic Analysis*, (CoPI w/ C. Bennett) (NSF), 1983–1985.
- *Mathematical Sciences Research Equipment*, (w/ nine other CoPI's) (NSF), 1983–1985.
- *Operators and Spaces of Functions*, (CoPI w/ C. Bennett) (NSF), 1981–1983.
- *Studies on Operators and Spaces of Functions*, (CoPI w/ C. Bennett and R. DeVore) (NSF), 1980–1981.
- *Studies on Weak Type Inequalities*, PI (w/ C. Bennett) (NSF), 1979–1980.
- *Studies on Maximal Interpolation Operators*, PI (NSF), 1977–1979.
- Oakland University Faculty Research Fellowship, 1973–1974.
- AFOSR (Investigator), 1972.
- National Science Foundation Traineeship, 1968–1971.

PROFESSIONAL CONSULTING

Anatomy and Computer Science Depts., University of Wisconsin, 1999, 2001-2003; ZeroTree Technologies, Inc (e-Media), Washington, DC, 2001; HydroGeoLogic, Inc., Herndon, VA, 1997-1998; Institute for Scientific Computation, Texas A&M, 1992.

REFEREED PUBLICATIONS

Monographs:

1. R.A. DeVore and R.C. Sharpley, “*Maximal Functions Measuring Smoothness*”, Memoirs of Amer. Math. Soc., Num. 293 **47** Providence, 1984, 115 pp.
2. C. Bennett and R.C. Sharpley, “*Interpolation of Operators*”, Academic Press, New York, 1988, 469 pp.

Original Research Articles:

1. R. Sharpley, *Spaces $\Lambda_\alpha(X)$ and interpolation*, J. Functional Anal. **11**(1972), 479–513.
2. R. Sharpley, *Interpolation theorems for compact operators*, Indiana Univ. Math. J. **22**(1973), 965–984.
3. R. Sharpley, *Interpolation of operators for Λ_ϕ spaces*, Bull. Amer. Math. Soc. **80**(1974), 258–261.
4. R. Sharpley, *Interpolation of n pairs and counterexamples employing indices*, J. Approximation Theory **13**(1975), 117–127.
5. R. Sharpley, *Characterization of intermediate spaces of M_ϕ spaces*, in “Linear Operators and Approximation II,” ISNM 25, Birkhäuser, Basel, 1975, 205–214.
6. R. Sharpley, *Fractional integration in Orlicz spaces*, Proc. Amer. Math. Soc. **59**(1976), 99–106.
7. R. Sharpley, *Multilinear weak type interpolation of m n -tuples with applications*, Studia Math. **60**(1977), 179–194.

8. C. Bennett and R. Sharpley, *Weak type inequalities in analysis* in “Linear Operators and Approximation,” ISNM 40, Birkhäuser, Basel, 1978, p. 151–162.
9. R. DeVore, S.D. Riemenschneider and R. Sharpley, *Weak interpolation in Banach space*, J. Functional Anal. **33**(1979), 58–94.
10. C. Bennett and R. Sharpley, *Weak type inequalities for H^p and BMO*, Proceedings of Symposia in Pure Mathematics **35.1**(1979), 201–229.
11. R. Sharpley, *Counterexamples for classical operators on Lorentz-Zygmund spaces*, Studia Math. **68**(1980), 141–158.
12. C. Bennett and R. Sharpley, *On an inequality for the sharp function*, in “Quantitative Approximation,” Academic Press, 1980, p. 1–6.
13. C. Bennett, R. DeVore and R. Sharpley, *Weak- L^∞ and BMO*, Annals of Math. **113**(1981), 601–611.
14. C. Bennett and R. Sharpley, *Interpolation between H^1 and L^∞* , in “Functional Analysis and Approximation, (Oberwolfach, 1980)”, pp. 111–116, Internat. Ser. Numer. Math. **60**, Birkhuser, Basel-Boston, Mass., 1981.
15. C. Bennett, R. DeVore and R. Sharpley, *Maximal singular integrals on L^∞* , Coll. Math. Soc. **35**(1983), 233–235.
16. R. Sharpley, *Cone conditions and the modulus of continuity*, Can. Math. Soc. Proc. **3**(1983), 341–351.
17. R. DeVore and R. Sharpley, *On the differentiability of functions in R^n* , Proceedings AMS **91**(1984), 326–328.
18. R. Sharpley, *Interpolation of H^1 and H^∞* , in “Anniversary Volume on Approximation Theory and Functional Analysis,” eds. P.L. Butzer, R. Stens, and B.Z. Nagy, ISNM, Vol. 65, Birkhäuser, Basel, 1984, p. 207–211.
19. R. DeVore, S.D. Riemenschneider and R. Sharpley, *n -Widths for C_p^α spaces*, in “Anniversary Volume on Approximation Theory and Functional Analysis,” eds. P.L. Butzer, R. Stens, and B.Z. Nagy, ISNM, Vol. 65, Birkhäuser, Basel, 1984, p. 213–222.
20. C. Bennett and R. Sharpley, *K -divisibility and a theorem of Lorentz and Shimogaki*, Proceedings AMS **96**(1986), 585–592.
21. R. Sharpley, *On the atomic decomposition of H^1 and interpolation*, Proceedings AMS **97**(1986), 186–188.
22. R. Sharpley, *A characterization of the interpolation spaces of $H^1(R)$ and $L^\infty(R)$* , Constr. Approx. **4**(1988), 199–209.
23. R. Sharpley and Y. Shim, *Singular integrals on C_p^α* , Studia Math. **92.3**(1989), 285–293.
24. J. Sochacki, P. O’Leary, C. Bennett, R.E. Ewing and R. Sharpley, *Seismic modeling and inversion on the NCUBE*, in “The Fifth Distributed Memory Conference,” eds. D. Walker and Q. Stout, IEEE Comp. Soc. Press, Washington, D.C., 1990, p. 530–535.
25. R. DeVore and R. Sharpley, *Besov Spaces on Domains in R^d* , Transactions Amer. Math. Soc. **335**(1993), 843–864.
26. R.E. Ewing, M.S. Espedal and R.C. Sharpley, *Contaminant Transfer Simulation of Unsaturated and Multiphase Flows in Porous Media*, in “Advances in Hydro-Science and Engineering,” Vol. 1, Part B. (S. Wang, ed.), University of Mississippi Press, 1993, 1867–1873.
27. R.E. Ewing, D. Mitchum, P. O’Leary, R.C. Sharpley and J.S. Sochacki, *Distributed Computation of Wave Propagation Models Using PVM*, Proceedings of Supercomputing ‘93 (to appear); rewritten by invitation for general audience in IEEE Parallel and Distributed Technology **2** (Spring 1994), 26–31.
28. K. Fadimba and R. Sharpley, *A Priori Estimates and Regularization for a Class of Porous Medium Equations*, Nonlinear World **2**(1995), 13–41.
29. R.E. Ewing, R.C. Sharpley, and H. Wang, *Eulerian-Lagrangian localized adjoint methods for transport of nuclear-waste contamination in porous media*, in “Computational Methods in Water Resources X,” Vol. 1 (A. Peters et al, eds.), Kluwer Academic Publ., Boston, 1994, 241–248.
30. R.E. Ewing, H. Wang, R.C. Sharpley and M.A. Celia, *A three dimensional finite element simulation for transport of nuclear-waste contamination in porous media*, in “Computer Methods and Advances in Geomechanics,” Vol. IV, A.A.Balkema Publishers, Rotterdam, Netherlands and Brookfield, U.S.A. (1995), 2673–2679.

31. H. Wang, R.C. Sharpley and R.E. Ewing, *On the Eulerian-Lagrangian localized adjoint methods for advective-diffusive transport equations*, in “Advanced Mathematics: Computations and Applications”, Computing Center SD RAS, Novosibirsk, Russia, (1996), 252–262.
32. H. Wang, R.C. Sharpley and S. Man, *An ELLAM scheme for advection-diffusion equations in multiple dimensions*, in “Computational Methods in Water Resources XI,” Vol. II: Computational Methods in Surface Flow and Transport Problems, Computational Mechanics Publications, South Hampton and Boston, 1996, 99–106.
33. R. Babarsky and R. Sharpley, *Expanded Stability Through Higher Temporal Accuracy for Time-Centered Advection Schemes*, The Monthly Weather Review, **125**(1997), 1277–1295.
34. L. Scott Johnson, A. Kaulgud, R.C. Sharpley, R.E. Ewing, Z. Leyk, J. Pasciak, M. Celia, and J.R. Brannan, *Integration of Contaminant Transport Simulators on Parallel Machines with a Graphical User Interface for Remote Interactive Modeling*, in “Proceedings of the 1997 Simulation Multiconference,” Atlanta, April 1997, Soc. for Computer Simulation International, San Diego, p. 319–324.
35. H. Wang, H.K. Dahle, R.E. Ewing, M.S. Espedal, R.C. Sharpley and S. Man, *An ELLAM scheme for advection-dispersion equations in two dimensions*, SIAM J. Scientific Computing **20** (1999), 2160–2194.
36. M. Al-Lawatia, R.C. Sharpley, and H. Wang, *A Characteristic Domain Decomposition and Space-Time Local Refinement Method for First-Order Linear Hyperbolic Equations with Interfaces*, Numer. Methods Partial Differential Eq. **15**(1999), 1–28.
37. M. Al-Lawatia, R.C. Sharpley, and H. Wang, *A Second Order Characteristic Method for Advection-Diffusion Equations and Comparison to Other Schemes*, Adv. Water Resources **22** (1999), 741–768.
38. R. DeVore, L.S. Johnson, C. Pan, and R. Sharpley, *Optimal entropy encoders for mining multiply resolved data*, in “Data Mining II”, N. Ebecken and C.A. Brebbia (eds.), WIT Press, Boston, 2000, p. 73-82.
39. H. Wang, M. Al-Lawatia, R.C. Sharpley, M.A. Celia, and A. Purnama, *Modeling solute transport in unsaturated soils by the Eulerian-Lagrangian localized adjoint method*, in “Towards a Safe Geoenvironment in the New Millennium. Proceedings of the International Conference on Geoenvironment 2000,” A. El-Zawahry , A.M. Shahalam, and R. Taha (eds.), Sultan Qaboos University Press, Muscat-Sultante of Oman, 2000, 466-477.
40. M. Al-Lawatia, R.C. Sharpley, and H. Wang, *A finite volume ELLAM for advection-diffusion equations*, in “Towards a Safe Geoenvironment in the New Millennium. Proceedings of the International Conference on Geoenvironment 2000,” A. El-Zawahry , A.M. Shahalam, and R. Taha (eds.), Sultan Qaboos University Press, Muscat-Sultante of Oman, 2000, 273–284.
41. M. Al-Lawatia, H. Wang, and R.C. Sharpley, *A parallel characteristic method for first-order hyperbolic equations*, Journal of the Faculty of Science, UAE University, **12(B)**, (2002), 1–13.
42. M. Al-Lawatia, R.C. Sharpley, and H. Wang, *A finite volume Runge-Kutta ELLAM method for the solution of advection-diffusion equations*, SQU Journal of Science and Technology **6**(2001), 67–83.
43. B. Karaivanov, P. Petrushev, and R. Sharpley, *Algorithms for Nonlinear piecewise polynomial approximation: Theoretical Aspects*, Transactions A.M.S., **355** (2003), 2585–2631.
44. R. DeVore, A. Petukhov, and R. Sharpley, *Motion estimation with the redundant wavelet transform*, “The Third International Workshop on Digital and Computational Video (DCV 2002)”, M.A. Bayoumi (ed.), IEEE Proceedings, St. Petersburg, Fl., 2002, p. 53–59.
45. K. Fadimba and R. Sharpley, *Galerkin finite element solutions for a class of porous medium equations*, Nonlinear Analysis **5** (2004), 355-387.
46. H.N. Stefansson, K.W. Eliceiri, C.F. Thomas, A. Ron, R. DeVore, R. Sharpley, and J.G. White, *Wavelet Compression of Three-Dimensional Time-lapse Biological Image Data*, Microscopy and Microanalysis **10**(2004), p. 1–9.
47. A. Kurdila, M. Nechyba, R. Lind, P. Ifju, P. Binev, W. Dahmen, R. DeVore, R. Sharpley, *Vision-Based Control of Micro-Air-Vehicles: Progress and Problems in Estimation*, 43rd IEEE Conference on Decision and Control, Paradise Island, Bahamas, December 2004, p. 1636–1642. Also appeared in IEEE Decision and Control (2005).
48. R.C. Sharpley and V. Vatchev, *Analysis of the Intrinsic Mode Functions*, Constr. Approx. **24** (2006), 17-47.

49. R.J. Prazenica, A.J. Kurdila, R.C. Sharpley, and J. Evers, *Multiresolution and Adaptive Path Planning for Maneuver of Micro-Air-Vehicles in Urban Environments*, American Institute of Aeronautics and Astronautics Guidance, Navigation, and Control (2005), 12 pp. (to appear).
50. D. Liang, H. Wang, and R.C. Sharpley, *Finite element approximations to one-phase nonlinear free boundary problem in groundwater contamination flow*, Numerical Methods for Partial Differential Equations **22**(6) (2006), 1267–1288.
51. V. Vatchev and R. Sharpley, *Decomposition of functions into pairs of intrinsic mode functions*, Proc. Royal Soc. Series A **464** (2008), 2265–2280.
52. P. Binev, F. Blanco-Silva, D. Blom, W. Dahmen, P. Lamby, R. Sharpley, and T. Vogt, *High Quality Image Formation by Nonlocal Means Applied to High-Angle Annular Darkfield Scanning Transmission Electron Microscopy (HAADF-STEM)*, in “Modeling Nanoscale Imaging in Electron Microscopy,” eds. T. Vogt, W. Dahmen & P. Binev, Nanostructure Science and Technology, Springer, 2012, pp. 127-145.
53. P. Binev, W. Dahmen, R. DeVore, P. Lamby, D. Savu, and R. Sharpley, *Compressed Sensing and Electron Microscopy*, in “Modeling Nanoscale Imaging in Electron Microscopy,” eds. T. Vogt, W. Dahmen & P. Binev, Nanostructure Science and Technology, Springer, 2012, pp. 73–126.
54. B. Berkels, P. Binev, D. Blom, W. Dahmen, R. Sharpley and T. Vogt, *Optimized Imaging Using Non-Rigid Registration*, Ultramicroscopy **138** (2014), 46-56.

TECHNICAL RESEARCH REPORTS:

1. A. Kaulgud and R.C. Sharpley. *An Interactive Tracking/Steering Library*, IMI Report 95:10, Department of Mathematics, University of South Carolina, Columbia, SC (Aug. 1995, rev. July 1997).
2. L.S. Johnson, A. Kaulgud and R.C. Sharpley, *G3D: A 3D User Environment for Partial Differential Equations*, IMI Report 97:01, Department of Mathematics, University of South Carolina, Columbia, SC (Jan. 97).
3. Z. Gao, A. Andreev and R.C. Sharpley, *Data Compression and Elementary Encoding of Wavelet Coefficients*, IMI Report 97:02, Department of Mathematics, University of South Carolina, Columbia, SC (Jan. 97).
4. A. Thies, B. Philips, P. Binev, R.A. DeVore, M. Hielsberg, L.S. Johnson, B. Karaivanov, B.A. Lane, R. C. Sharpley, *Smooth, Piecewise-Polynomial Terrain Representation Using Nontraditional Metrics*, STTR Final Report, Schafer Corporation Contract No. W911NF-04-C-0060, U.S. Army Research Office, March 2, 2005.
5. A. Thies, R.A. DeVore, M. Hielsberg, L.S. Johnson, and R.C. Sharpley, *Software for Generating Geometrically & Topologically Accurate Urban Terrain Models Using Implicit Methods*, STTR Phase I Final Report, Radiance Technologies Contract No. W911NF-06-C-0145, U.S. Army Research Office, March 2, 2007.
6. P. Binev, F. Blanco-Silva, D. A. Blom, W. Dahmen, R. Sharpley, T. Vogt, *Super-Resolution Image Reconstruction by Nonlocal-Means applied to HAADF-STEM*, IMI Preprint Series 2009:06, University of South Carolina.
7. D. Carrasco Diaz (ESP), J. Fournier (CAN), J. Lavery (USA), R. Sharpley (USA), K. McEwan (GBR), J. Meidow (DEU), S. Pasquariello (ITA) and G. Tolt (SWE), *3D Modeling of Urban Terrain*, NATO Research and Technology Organization Task Group, RTO-TR-SET-118, Sept 2011, pp 118. [ISBN: 978-92-837-0144-6]

SYNERGISTIC ACTIVITIES:

- Prepared and delivered Undergraduate courses from more than 26 different subject areas in Mathematics, Computer Science, and Statistics. A sample listing includes a Summer Program in Arithmetic & Algebra for Disadvantaged Youth (Detroit, 1974), Precalculus, Calculus I-III, Discrete Math, Data Structures, Linear Algebra, Numerical Analysis, Probability Theory, Partial Differential Equations, Statistics for Engineers, Real Analysis I-II, Applied Complex Variables, Abstract Algebra I-II, Computational Science, Wavelets, Foundations of Geometry, Modern Geometry.
- Prepared and delivered Graduate courses from more than 20 different Mathematical subject areas, including Modeling, Applied Mathematics, Numerical Computation, Approximation Theory, Fourier Analysis, PDE, Optimization, Real Analysis, Complex Analysis, Finite Elements, Complex Analysis, Wavelets and Multiresolution Analysis.
- Performed referee work for 42 research journals in the disciplines of pure and applied mathematics, computational science, computer science, chemical engineering, mechanical engineering, civil and environmental engineering, electrical engineering. External Reviewer and External Examiner for the Department of Mathematics and Statistics, Sultan Qaboos Univ., Oman (2005-present).
- Organized and directed the efforts of the Industrial Mathematics Computational Laboratory (1992-present) in the implementation of algorithms to illustrate the significance of theoretical mathematical advances and to validate computational efficiency, stability, and robustness. Developed tech transfer efforts with industry through SBIR and STTR projects, as well as multi-university collaborations to address problems of national interest.
- Participated in two major NSF EPSCoR (Experimental Program to Stimulate Competitive Research) initiatives and several Department of Defense counterparts, with the goal of strengthening the research and educational infrastructure of university programs through focused research and permanent faculty appointments. The first NSF initiative served as the foundation for the Industrial Mathematics Institute (later known as the Interdisciplinary Mathematics Institute) and the second involved the university's efforts to develop programs for viable vascular systems for organ biofabrication, particularly the aspects involving research computing infrastructure. Statewide activities include serving on the State EPSCoR committee as USC faculty representative from 1994-1997.

LIST OF COLLABORATORS (LAST FIVE YEARS):

K. Fadimba (USC Aiken); S. Osher (UCLA); S. Kulkarni (Princeton); R. Baraniuk (Rice); S. Zheng (Georgia Southern Univ.), M. Al-Lawatia (Sultan Qaboos Univ., Oman), V. Vatchev (U. Texas, Brownsville); University of South Carolina: T. Vogt, D. Blom, W. Dahmen, P. Petrushev, P. Binev, B. Karaivanov, L. Owens, F. Blanco-Silva, P. Lamby, B. Berkels, J. Ebalunode, N. Sergueev, H. Wang, L.S. Johnson, D. Savu; T. Carnegie Mellon Univ.: T. Kanade, Q. Ke; University of Wisconsin: A. Ron, J. White, K. Eliceiri; Texas A&M University: R.A. DeVore, G. Petrova, S. Schafer; Univ. of Florida: P. Ifju, R. Lind, W. Dixon; Virginia Tech: A. Kurdila, M. Pierson; Schafer Corporation: B. Phillips; Radiance Technologies: A. Thies, J. Lane, R. Prazenica, Patrick Lyles; Stanford University: D. Donoho, L. Guibas, M. Shahram; DRDC-Valcartier: B. Ricard and J. Fournier; K. McEwan (dstl-UK); WP-AFRL/SNJM: R. Richmond and M. Gebhardt; G. Tolt (FOI-Sweden).

Ph.D ADVISOR: George G. Lorentz

GRADUATE STUDENTS ADVISED: 23

POSTDOCTORAL ASSOCIATES SUPPORTED: 15