

James M. Westall

PERSONAL DATA

Professor
Department of Computer Science
Clemson University
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EDUCATION

M.S., UNC Chapel Hill, 1978, Computer Science
Ph.D., UNC Chapel Hill, 1973, Mathematics
B.S., Davidson College, 1968, Mathematics & Physics

PROFESSIONAL EXPERIENCE

Clemson University

2009 - Professor of Computer Science
1994 - 2009 Professor of Computer Science and Director of Graduate Affairs
1980 - 1994 Associate Professor of Computer Science
1978 - 1980 Assistant Professor of Computer Science
1974 - 1978 Assistant Professor of Mathematical Sciences

University of North Carolina at Chapel Hill

1973 - 1974 Instructor (Evening College)

United States Army

1968 – 1981 US Army Reserve, Signal Corps (2LT, 1LT, CPT)
1973 Signal Officer's Basic Course, Ft. Gordon, GA

HONORS AND AWARDS

Sigma Pi Sigma Physics Honor Society

Distinguished Graduate, US Army Signal School, Signal Officer's Basic Course

Sigma Xi Scientific Research Society

Guenther Enderle Award for Best Paper 26th Annual Eurographics Conference

CONSULTING

Series One Inc., Greenville SC (1977 - 1978), Design and implementation of the I/O and file management components of a multitasking operating system for the Series/1 minicomputer.

QS Inc., Greenville SC (1979 - 1980), Design and implementation of an online vital records system for the state government of Wisconsin.

Broadway & Seymour, Inc., Charlotte NC (1984), Design of an IBM SNA LU type 7 emulation mode for the IBM 470x family of banking terminals.

IBM Corporation, Charlotte, NC (1986 - 1997), Development of systems used in the segmentation and recognition of unconstrained handwritten characters on financial documents.

General Electric Corporation, Greenville, SC (1990, 1997), Design and implementation of systems for evaluating the alignment and balance of multi-rotor gas turbines.

Neural Technologies Inc., Pendleton SC (1996, 1997), Techniques for identifying and preventing intrusion in computer networks.

PROFESSIONAL AFFILIATIONS

Association for Computing Machinery, ACM, SIGOPS, SIGARCH, SIGMETRICS , SIGCOMM

Affiliate, IEEE Computer Society

Sigma Xi

PUBLICATIONS

Journal Publications

Westall, J. M., "Banach Spaces of L_p Valued Holomorphic Mappings", *Duke Math Journal*, **40**(4), 755-763 (1973).

Geist, R. M., Reynolds, R. R., and Westall J. M., "Selection of a Checkpoint Interval in a Critical Task Environment", *IEEE Transactions on Reliability*, **37**(4), 395-400 (1988).

Westall, J. M. and Narasimha, M. S., "Vertex Directed Segmentation of Handwritten Numerals," *Pattern Recognition*, **26**(10), 1473-1486 (1993).

Westall, J. M. and Narasimha M. S., "An Evolutionary Approach to the Use of Neural Networks in the Segmentation of Handwritten Numerals" , *The International Journal of Pattern Recognition and Artificial Intelligence: Special issue on bank check processing*, **5**(May 1997), 717-734.

Geist, R. M. and Westall J. M., "Correlational and Distributional Effects in Network Traffic Models: Extended Version", *Performance Evaluation*, **44**(1), 121-138 (2001).

Rache, K., Geist, R. M., and Westall, J. M., "Detail Preserving Reproduction of Color Images for Monochromats and Dichromats," *IEEE Computer Graphics and Applications*, **25**(3), 22-30, (May/June 2005).

Rasche, K., Geist, R., and Westall, J., "Re-Coloring Images for Gamuts of Lower Dimension", *Computer Graphics Forum*, **24**:3 (2005), pp. 423 - 432.

Martin, J. and Westall, J., "A Simulation Model of the DOCSIS Protocol", *Simulation*, Vol. 83, No. 2, 139-155 (2007)

Zhou, Y., Y. Chowdhury, Martin J., Wang K.C., Westall, J., "Field Performance Study of a Regional WiMAX Network for Intelligent Transportation System Applications", *Journal of the Transportation Research Board*, Transportation Research Board, Issue Number 2129, pp 121-128, (2009).

Westall, J. and Martin, J., "Performance Characteristics of an Operational WiMAX Network", *IEEE Trans. Mobile Computing*, to appear.

Peer Reviewed Papers in Conference Proceedings

Westall, J. M., Norton, H. T., and Narasimha, M. S. ``Segmentation of Handwritten Numeric Characters", in *Proc. of the IBM Internal Technical Liaison Conference on Image Processing* (San Jose Ca., Aug. 1988).

Stevenson, D.E., Toppur, R., and Westall, J. M., ``Performance of Mutual Exclusion Algorithms on Hypercubes", in *Proc. of the 1989 Hypercube Conference* (Charleston S. C., Feb. 1989).

Westall, J. M., ``Cache and Block Size Considerations in Personal Computer Disk Caches", in *Proc. of the 29th Annual ACM Southeast Conf.* (Auburn Al., Apr. 1990).

Westall, J. M. and Narasimha, M. S., ``Neural Network Extensions to Vertex Directed Segmentation", in *Proc. of the IBM Internal Technical Liaison Conference on Neural Networks* (East Fishkill N. Y., May 1992).

Madison, A. W., Malloy, B. A., Peck, J.C. and Westall, J. M., ``A Cost Effective CIM System for Apparel Manufacture", in *Proc. of the 4th Academic Apparel Research Conf.* (Raleigh N.C., Feb. 1993).

Westall, J. M. and Narasimha, M. S., ``Performance Analysis of Vertex Directed Segmentation", In *Proc. of the IBM Internal Technical Liaison Conference on Image Processing* (Charlotte N.C., Oct. 1993).

Geist, R. M. and Westall, J. M., ``Disk Scheduling in Linux", in *Proc. 20th Int'l CMG Conference* (Orlando Fl., Dec. 1994), pp. 739-746.

Madison, A. W., Murray, T. J., and Westall, J. M., ``Lookahead Page Placement", in *Proc. of the 33rd Annual ACM Southeast Conf.* (Clemson S.C., Apr. 1994), pp. 146-155.

Fennell, R. E., Westall, J. M., and Wypasek, C. J., ``Identifying Periods of Availability in Elements of a Distributed System", in *Proc. of the Seventh IASTED & ISSM Conf. on Parallel and Distributed Computing* (Washington D.C., Oct. 1995).

Fennell, R. E., Kiessler, P., Westall, J. M., and Wypasek, C. J., ``Markov Renewal Models for Traffic Exhibiting Self-Similar Behavior", in *Proc. of the IEEE Southeastcon* (Tampa Fl., Apr. 1996).

Madison, A. W., Murray, T. J., and Westall, J. M., ``Colored Page Stealing'', in *Proc. of the 34th Annual ACM Southeast Conf.* (Tuskegee Al., Apr. 1996), pp. 28 - 34.

Geist, R. M., Smotherman, M. K., and Westall, J. M., ``Performance Evaluation of NUMA Architectures'', in *Proc. of the 34th Annual ACM Southeast Conf.* (Tuskegee Al., Apr. 1996), pp. 78 - 85.

Geist, R. M. and Westall, J. M., ``Performance and Availability Evaluation of NUMA Architectures'', in *Proc. of the IEEE Int. Computer Performance and Dependability Symp. (IPDS '96)*, (Urbana Ill., Sept. 1996), pp. 271 - 280.

Geist, R. M. and Westall, J. M., ``A Hybrid Tool for the Performance Evaluation of NUMA Architectures'', in *Proc. of the 1997 Winter Simulation Conf.* (Atlanta Ga., Dec. 1997), pp. 1029-1036.

Geist R., and Westall, J., ``Bringing the High End to the Low End: High Performance Device Drivers for the Linux PC'', in *Proc. of the 36th Annual ACM Southeast Conf.* (Marietta, Ga., Apr 1998), pp. 251-260.

Bahadur, S., Kalyanakrishnan, V., and Westall, J. M., ``An Empirical Study of the Effects of Careful Page Placement in Linux'', in *Proc. of the 36th Annual ACM Southeast Conf.* (Marietta, Ga., Apr 1998), pp. 241-250.

Flower, A., Geist, R. M., and Westall, J.M., ``ATM Device Driver Development in Linux'', in *Proc. of the 4th Annual Linux Expo* (Durham, NC, May 1998).

Geist R., Treglia D., and Westall, J.M., ``Real-time 3-D Graphics for the Linux PC'', in *Proc. of the 24th International CMG Conference*, (Anaheim, CA, Dec 1998).

Geist R., Treglia D., and Westall, J.M., ``Real-time 3-D Graphics in Linux'', in *Proc. of the 5th Annual Linux Expo*, (Raleigh, NC, May 1999), pp. 9-17.

Geist, R., Spicer, K., and Westall, J., ``Simulation Modeling of Self-similarity in Network Traffic Models'', in *Proc. of the 25th International CMG Conference*, (Reno, NV, Dec 1999), pp. 803-811.

Geist, R. and Westall J., ``Correlational and Distributional Effects in Network Traffic Models", in *Proc. of the IEEE Intl. Computer Performance and Dependability Symp. (IPDS 00)*, (Chicago Ill., Mar. 2000), pp. 113-122.

Geist, R. and Westall, J., Practical Aspects of Simulating Systems Having Arrival Processes with Long-range Dependence, in *Proc. of the 2000 Winter Simulation Conf.* (Orlando, Fl., Dec 2000), pp. 666-674.

Geist, R., Paramisivam, K., and Westall, J., ``Enhanced Scheduling Performance on Linux Disk Mirrors", in *Proc. of the 26th International CMG Conference*, (Orlando, FL, Dec 2000), pp. 515-522.

Westall, J., ``A Simple, Configurable, and Adaptive Firewall, for Linux", in *Proc. of the 39th Annual ACM Southeast Conference*, (Athens, Ga., Mar. 2001), pp. 162-168.

Geist, R., Sekhar, V., and Westall, J., ``Graphics Benchmarking," In *Proc. of the 27th Annual International CMG Conference, (CMG 2001)*, (Anaheim, CA, Dec 2001), pp 151-160.

Geist, R., and Westall, J., ``Fast and Accurate Synthesis of Correlated Processes by Pre-compensated Transfer of Correlation," in *Proc. of Communication Networks and Distributed Systems Modeling and Simulation (CNDS 02)*, (San Antonio, TX, Jan 2002), pp. 11-17.

Geist, R., Rache, K., and Westall, J., ``An HSV Representation of non-Newtonian Lattice-Boltzmann Flows", in *Proc. of the SPIE - Data Analysis and Visualization 2002*, (San Jose, CA, Jan 2002), pp 246-258.

Geist, R., Rasche, K., and Westall, J., ``Out of Order Rendering on Visualization Clusters," in *Proc. of the IASTED Intl. Conf. on MODELLING and SIMULATION*, (Palm Springs, Ca., Feb. 2003), pp. 461-467.

Geist, R., Wells, P., and Westall, J., ``The Effect of Leaky Bucket Filters and TCP Congestion Feedback on Network Traffic Arrival Processes," in *Proc. of the 41st Annual ACM Southeast Conference*, (Savannah, Ga., Mar. 2003), pp. 286-291.

Geist, R., Rasche, K., Srivatsavai, R., and Westall, J., "A Distributed Rendering System for Scientific Visualization," in *Proc. of the 41st Annual ACM Southeast Conference*, (Savannah, Ga., Mar. 2003, pp. 359-364.

Davis, T., Geist, R., Matzko, S., Westall, J., "Texni: A First Step", in Proc. of the 35th SIGCSE Technical Symposium on Computer Science Education, (Norfolk, VA, Mar. 2004), pp. 125-129,

Davis, T., Geist, R., Wang, S., Westall, J. and Kundert-Gibbs, J., "Digital Production Arts: Coming Soon to a College Near You!", in *Proc. of the 42nd Annual ACM Southeast Conf.*, (Huntsville, AL, Apr. 2004), pp. 416 - 421.

Geist, R., Rasche, K., Westall, J., and Schalkoff, R., "Lattice-Boltzmann Lighting," *Rendering Techniques 2004 (Proc. Eurographics Symposium on Rendering)*, Norrköing, Sweden, June, 2004, pp. 355 - 362, 423.

Davis, T., Geist, R., Matzko, S., and Westall, J., "Course Development in Texni," *Proc. of the 2004 Eurographics Education Program*, Grenoble, France, August, 2004, pp. 23 - 27.

Geist, R. Martin, J., and Westall, J., "Small Aggregations of ON/OFF Traffic Sources", *Proceedings of the IASTED International Conference on Communication and Computer Networks*, (Boston, MA, Nov, 2004), pp 312-318.

Martin, J., Westall, M., Rajasekaran, V., "On the Impact of Virtual Machine Overhead on TCP Performance," *Proceedings of the IASTED International Conference on Communication and Computer Networks*, (Boston, MA, Nov, 2004), pp. 287-292.

Martin, J., Westall, J., and V. Rajasekaran, "Virtual Machine Effects on Network Traffic Dynamics", *Proceedings of the IEEE International Performance, Computing, and Communications Conference*, (Phoenix, AZ, April 2005), pp. 233-238.

Geist, R., Hicks, J., Smotherman, M., and Westall, J., "Parallel Simulation of Petri Nets on Desktop PC Hardware," *Proc. of the 2005 Winter Simulation Conf. (WSC 2005)*, (Orlando, Florida, December, 2005), pp. 374-383.

Geist, R., Steele, J., and Westall, J., "Enhancing Webserver Performance Through the Use of a Drop-in, Statically Optimal, Disk Scheduler," *Proc. of the 31st Annual Int. Conf. of the Computer Measurement Group (CMG 2005)*, (Orlando, Florida, December, 2005, v.2), pp. 697-706.

Geist, R., Martin, J., Westall, J., and Yalla, V., "Performance Tuning of Gigabit Network Interfaces," *Proc. of the 31st Annual Int. Conf. of the Computer Measurement Group (CMG 2005)*, (Orlando, Florida, December, 2005, v.2), pp. 687-696.

Martin, J. and Westall, J., "Validating an 'ns' Simulation Model of the DOCSIS Protocol", *Proceedings of the 2006 International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS'06)*, (Calgary, CA, July 2006), pp. 297-304.

Davis, T., Geist, R., Matzko, S. and Westall, J. , "Course Development under *Texnh*," { it SIGGRAPH Educator's Program } (2006), Boston, MA, July 2006.

Davis, T., Geist, R., Matzko, S., Westall, J., "*Texnh*: Trial Phase for the New Curriculum", in *Proc. of the 38th SIGCSE Technical Symposium on Computer Science Education*, (Covington, KY, Mar. 2007).

Martin, J. and Westall, J., "Assessing the Impact of BitTorrent on DOCSIS Networks", *Proceedings of IEEE BROADNETS 2007, Fourth International Conference on Broadband Communications, Networks, and Systems*, (Raleigh, NC, Sep. 2007).

Geist, R., Steele, J., and Westall, J., "Convective Clouds," *Natural Phenomena 2007 (Proc. of the Eurographics Workshop on Natural Phenomena)*, Prague, Czech Republic, September, 2007, pp. 23 - 30, 83, and back cover.

Harney E., Goasguen, S., Martin J., Murphy, M., Westall, J , "The Efficacy of Live Virtual Machine Migrations Over the Internet", *Proceedings of the 2nd International Workshop on Virtualization Technologies in Distributed Computing (VTDC 2007)*, (Reno, Nevada, November 2007).

Geist, R., Jones, Z. H., and Westall, J., "Virtualization of an Advanced Course in Operating Systems," *Proc. 3rd Int. Conf. on the Virtual Computing Initiative (ICVCI3)*, October 21-22, 2009, Raleigh, NC.

Wang, J., Davis, T., Srimani, P. and Westall, J., "MeTube: A Novel way to teach Database to Undergraduates", *Proceedings of the 39th Annual Frontiers in Education Conference (FIE 2009)*, (San Antonio, Texas, November 2009).

Geist, R., Jones, Z. H., and Westall, J., "Virtualizing High-Performance Graphics Cards for Driver Design and Development," *Proc. 19th Annual Int. Conf. of the IBM Centers for Advanced Studies (CASCON 2009)*, (Toronto, Ontario, Canada, November, 2009), pp. 261-269.

Wang, J., Davis, T., Srimani, P. and Westall, J., "Undergraduate Database Instruction with MeTube", *ITiCSE 2010, the 15th Annual Conference on Innovation and Technology in Computer Science Education*, (Ankara, Turkey, June 2010).

Martin, J. Westall, J. Finkelstein, G. Hart, T. Shaw, G. White, and R. Woundy, "Cable Modem Buffer Management in DOCSIS Networks", *Proceedings of the IEEE Sarnoff 2010 Symposium*, (Princeton University, Princeton NJ, April 2010).

Moser, S. Martin, J. , Westall, J. and Dean B., "The Role of Max-min Fairness in DOCSIS 3.0 Downstream Channel Bonding", *Proceedings of the IEEE Sarnoff 2010 Symposium*, (Princeton University, Princeton NJ, April 2010).

Martin, J., Li, B. Pressly, W., and Westall, J., "WiMAX Performance at 4.9 GHz", *Proceedings of the 2010 IEEE Aerospace Conference*, (Big Sky, Montana, March 2010).

Geist, R., and Westall, J., "Lattice-Boltzmann Lighting Models", GPUGEMS IV, to appear December 2010.

Other Peer Reviewed Publications

Westall, J. M., "Analysis and Splitting of Potentially Connected Numeric Handprint Characters", *IBM Technical Disclosure Bulletin*, **33**(6a), Nov. 1990, pp. 236-241.

Narasimha, M. S., Westall, J. M., and Will, T. A., "Grayscale Assist in Machine Recognition of Courtesy Amounts", *IBM Technical Disclosure Bulletin*, **34**(5), Oct. 1991, pp. 374-377.

Westall, J. M., Norton, H. T., and Narasimha, M. S., "A Graphical Interface for Image Attribute Specification", *IBM Technical Disclosure Bulletin*, **35**(11), Nov. 1992, pp. 374-375.

Westall, J. M., "Partitioned Class Recognition by Computational Neural Network", *IBM Technical Disclosure Bulletin*, **37**(11), Nov. 1994, pp. 7-10.

Westall, J. M., Mai, D. D., and Narasimha, M. S., "Edge and Vertex Directed Identification and Removal of Fraction Lines", *IBM Technical Disclosure Bulletin*, **38**(8), Aug. 1995, pp. 517-520.

Westall, J. M. and Narasimha, M. S., "A Binary Tree Structure for Managing Alternate Segmentation Paths in the Optical Character Recognition of Courtesy Amount Fields", *IBM Technical Disclosure Bulletin*, **38**(12), Dec. 1995, pp. 215-218.

Invited Papers

Westall, J. M., "A CIM Architecture for Apparel Manufacturing", *Bobbin*, **32**(6), Feb. 1991, pp. 14-18.

Westall, J. M., "Accelerated 3D Graphics in an Xfree86 Environment", in *Proc. 38th Annual ACM Southeast Conf. (Clemson, SC, Apr. 7-8), 2000*.

Other Publications

Smotherman, M. K. and Westall, J. M., "Dynamic Control of Job Arrival Distributions", in *Proc. 24th Annual ACM Southeast Conf.* (Tampa Fl., Apr. 13-15), 1985.

Madison, A. W. and Westall, J. M., "Advanced Memory Management Architectures and Virtual Machine Monitors", in *Proc. 24th Annual ACM Southeast Conf.* (Birmingham Al., Apr. 1986).

Hollis, W. M. and Westall, J. M. "C Language Portability Considerations" in *Proc. 24th Annual ACM Southeast Conf.* (Birmingham Al., Apr. 1986).

Technical Reports

Westall, J. M., "The Clemson Editor User's Guide", Clemson University Computer Center (1976).

Westall, J. M., "The X Command Procedure Processor User's Guide", Clemson University Computer Center (1977).

Warner, D. D., Westall, J. M., Jarvis, J., and McKeever, K., "Using the Tactical Air Land Combat (TALC) Simulation Model", Dept. of Mathematical Sciences Technical Report, Clemson University (1985).

Westall, J. M. and Narasimha, M. S., "Efficient Generation of Interpel Distance Tables and Their Use in Segmentation of Handwritten Numerals", IBM Internal Invention Disclosure (Jan. 1988).

Westall, J. M. and Narasimha, M. S., "Tree Structured Management of Alternative Paths in Segmentation of Handwritten Numeric Data", IBM Internal Invention Disclosure (June 1988).

Westall, J. M., "Disk Cache Performance Effects in Personal Computer Systems", A technical report prepared for the NCR Corporation (Aug. 1988).

Westall, J. M., "Using the CDT Distributed Debugging System", A technical report prepared for the IBM Corporation (July 1989).

Westall, J. M., ``Reduction of Invalidate Traffic in Non-snooping Caches by Use of an Invalidated Address Stack", A technical report prepared for the NCR Corporation (Aug. 1989).

Westall, J. M., ``The Performance Effects of Alternative Combining Store Designs in Write Update and Write Through Cache Memories", A technical report prepared for the NCR Corporation (Oct. 1989).

Westall, J. M., ``Cache Memory Effects of Task Migration in Multiprocessor Systems", A technical report prepared for the NCR Corporation (Jan. 1990).

Westall, J. M., ``The Effects of Cache Write Miss Policy (Allocate or Not) on Bus Loading", A technical report prepared for the NCR Corporation (Oct. 1990).

Westall, J. M., ``An Evaluation of the Effectiveness of Single and Multi-line Instruction Prefetch Buffers in Both Single and Multilevel Cache Memory Systems", A technical report prepared for the NCR Corporation (Jan 1991).

Westall, J. M., ``A Procedure for Evaluating Alignment and Balance in Multi-rotor Turbine Stacks", A technical report prepared for the General Electric Corporation (March 1991).

Westall, J. M., ``A Performance Comparison of a 4 Way Set Associative Cache with Sectored Writebacks to a Non-sectored 2 Way Set Associative Cache", A technical report prepared for the NCR corporation (June 1992).

Madison, A. W., Westall, J. M., Buddhavaparu B., and Moolky, S., ``The MicroCIM Architecture Manual", A technical report prepared for the Defense Logistics Agency (Aug. 1992).

Madison, A. W., Westall, J. M., Buddhavaparu B., and Moolky, S., ``The MicroCIM Operator's Manual", A technical report prepared for the Defense Logistics Agency (Aug. 1992).

Madison, A. W., Westall, J. M., Buddhavaparu B., and Moolky, S., ``The MicroCIM Programmer's Manual", A technical report prepared for the Defense Logistics Agency (Aug. 1992).

Westall, J. M., ``An Analysis of the Use of Long Lines and Sectoring Staging in Large Secondary Caches'', A technical support prepared for the NCR corporation (Aug. 1992).

Baker, J. N. and Westall, J. M., ``An Analysis of the Effects of Page Placement in Systems with Large Real Indexed Direct Mapped Caches'', A technical report prepared for the NCR Corporation (Nov. 1992).

Westall, J. M., ``Principles of Working Set Based Workload Characterization and Cache Miss Ratio Prediction in First and Second Level Caches'', A technical report prepared for the NCR Corporation (Jan. 1993).

Moolky, S. and Westall, J. M., ``Working Set Based Workload Characterization and Cache Miss Rate Prediction'', A technical report prepared for the NCR Corporation (Aug. 1993).

Other Conference Presentations

Westall, J. M., ``An Introduction to the Clemson Editor and Source Management System'', SHARE 53 (New York N.Y., Aug. 1979).

Westall, J. M., ``TSO Performance Effects of the Use of the Clemson Editor System'', Southern Computer Measurement Group (Charlotte N. C., Oct. 1979).

Westall, J. M., ``Applications of Operational Analysis of Closed Queuing Networks'', Southern Computer Measurement Group (Charlotte N. C., Oct. 1980).

Westall, J. M., ``Performance Management of a Large TSO Subsystem'', CMG National Conference (Boston Ma., Dec. 1980).

Westall, J. M., ``An Analysis of Selected DASD Performance Models'', Southern Computer Measurement Group (Atlanta Ga., Apr. 1982).

Madison, A. W., and Westall, J. M., ``A Computer Operating System for Distributed Control of Manufacturing'', Academic Apparel Research Conference (Clemson S.C., Feb. 1991).

Fennell, R. E., Westall, J. M. and Wypasek, C. J., ``Distribution of Load in Large Networks of Workstations'', CCCS Annual Conference (Clemson S. C. , Sept. 1992).

Fennell, R. E., Westall, J. M. and Wypasek, C. J., "Identifying Sources of Available Capacity in Workstation Networks", CCCS Annual Conference (Clemson S. C. , Nov. 1993).

Fennell, R. E., Westall, J. M. and Wypasek, C. J., "Stochastic Point Process Models for Workstation Utilization", 14th Annual Southeast-Atlantic Regional Conf. on Differential Equations (Knoxville Tenn., Oct. 1994).

Fennell, R. E., Westall, J. M. and Wypasek, C. J., "Filtering of a Semi-martingale Base upon Non-orthogonal Point Process Observations", 19th Annual Meeting of the SIAM Southeastern Atlantic Section (Charleston S.C., March 1995).

SPONSORED RESEARCH

Warner, D. D. and Westall, J. M., "Communications, command, and control: Studies in communications methodology". Funded by DOD Test and Evaluation through the C3 Countermeasures Joint Test Force at Kirtland AFB, Albuquerque N. M. from June 1983 through November 1985 at \$660,000.

Madison, A. W. and Westall, J. M., "Virtual Machine Monitors for Advanced Microprocessor Based Systems". Funded by the NCR Corp. from July 1986 through December 1986 at \$40,000.

Westall, J. M., "Performance Effects of Disk Caching in Microprocessor Based Systems". Funded by the NCR Corp. from July 1987 through October 1987 at \$27,000.

Madison, A. W., Peck, J. C., and Westall, J. M., "An Operating System for Distributed Control of Manufacturing". Funded by DOD through the Defense Logistics Agency from October 1989 through February 1990 at \$148,000

Madison, A. W., Peck, J. C., and Westall, J. M., "Extensions to the Operating System for Distributed Control of Manufacturing". Funded by DOD through the Defense Logistics Agency from June 1990 through September 1991 at \$52, 560.

Madison, A. W. and Westall, J. M. "Performance Measurement of the MicroCIM Operating System". Funded by DOD through the Defense Logistics Agency from September 1991 through September 1992 at \$10,839.

Madison, A. W., Pargas, R. P., and Westall, J. M., ``Investigations of Multiprocessor Design Issues". Funded by the NCR Corp. from December 1988 through May 1990 at \$158,000.

Westall, J. M., ``Analysis and Evaluation of Multiprocessor Design Alternatives". Funded by the NCR Corp. from Sept. 1990 through Sept. 1991 at \$49,194.

Westall, J. M., ``Analysis of Memory Referencing Behavior Models and Cache Memory Performance". Funded by NCR Corp. from Nov. 1991 through Feb. 1993 at 49,343.

Westall, J. M., ``Analysis of Frame Buffer Referencing and Video Subsystem Performance". Funded by the NCR Corp. from May 1993 through Jan 1994 at \$52,000.

Geist, R. M. and Westall, J. M., ``A Linux Workstation for High Performance Graphics". Funded by NASA from January 1997 through February 2000 at \$148,056.

Geist, R. M. and Westall, J. M., ``ATM Network Support for the Linux Operating System". Funded by the IBM Corp. from January 1997 through December 1998 at \$58,000.

Geist, R. M. and Westall, J.M., IBM SUR Equipment Grant, Dec 1997, \$350,000.

Geist, R. M. and Westall, J.M., IBM ATM Switch Grant, July 1998, \$20,000.

Druffel, L., Geist, R. M., Westall, J.M., et al. ``SCINET- An Internet II Connection Proposal for the State of South Carolina", January 1998, Funded by the National Science Foundation from Sept 1998 through Sept 2000 at \$350,000.

Geist, R. M., Westall, J.M., et. al. ``An Upgrade to Clemson's Graphics-Supercomputer" Internal research proposal to CU Provost, Funded by the CU Foundation at \$115,000.

Geist, R.M, Davis, T. A. Oagle, A., and Westall, J.M., ``Real-Time Visualization of Polymer Flows", Funded by NASA through the SC Space Grant Consortium from Jan 2000 through Dec 2000 at \$25,000.

Geist, R. M., and Westall, J.M., ``Graphics Benchmarking for Linux Systems", Funded by the Dell Computer Corporation from Oct 2000 through Oct 2001 at \$48,875.

Geist, R. M., and Westall, J. M., "ITR/SI: Design and Implementation of a Graphics Supercomputer from Commodity Components", Funded by the National Science Foundation from August 2001 through July 2004 at \$267,010

Geist, R.M., and Westall, J.M. , "Validated Modeling of Network Component Performance: A Collaborative Research Effort Involving the Center for Advanced Computing and Communication (CACC) and Clemson University. Funded by the National Science Foundation from Oct 2001 through Sep 2002 at \$50,000

Wang, S., Geist, R. M., Westall, J.M. et al., Investigation of Space-Time Photography, a CHE SCRIG Infrastructure project , Funded by the Clemson University Research Office in Oct 2001 at \$47,000.

Leudeman, J.K., Westall, J.M., et al., Clemson University GK-12 Project Sponsored by NSF (National Science Foundation) from Apr 2001 through March 2002 at \$421,461.

Davis, T. A., Geist, R. M., Westall, J. M. et. al., TEXNH: A New Approach to the B.A. Degree in Computer Science, Sponsored by the NSF (CISE/EIA) July, 2003 - July, 2006 at \$330,000.

Westall, J. M. (Associate Investigator), Center for Advanced Engineering Fibers and Films, NSF (ERC), \$16,571,478, Summer 2002-2003.

Geist, R., Westall, J. et al., IBM Parallel Processing Laboratory, IBM, xSeries Blade Center (equipment, U.S. list \$125,000) June, 2004.

Geist, R. M and Westall J. M., Performance Evaluation of Large Disk Array Systems, Network Appliance Corp., \$24,000 (graduate student fellowship), January, 2005 - May, 2005.

Geist, R. M and Westall J. M., Motion Capture in Clinical Science, Mindfield, LLC, Charleston County, U.S. Dept. of Education, \$146,688, October, 2004 - September, 2005.

Martin, J. and Westall, J. M., Evaluating IEEE 802.16 Broadband Wireless as a Communications Infrastructure for Public Safety Activities, \$300,000, National Institute of Justice, October 2006- October 2008.

Westall, J., Davis, T., Duchowski, A. Geist, R., Srimani, P, Wang, J., Krehling. W., Holliday M. and Narayan S. CPATH EAE: TEXNH - Evaluation, Adoption, and Extension, \$470,000, National Science Foundation, August 2007-August 2011.

Westall, J., Geist, R., Dean, B., Schalkoff, R., Srimani, P., and Woodard, D., An Experimental Super Computer from Commodity Components, \$100,000, Clemson University Research Investment Fund Program, February 2007.

Martin, J. and Westall. J., DOCSIS 3.0 Scheduling Algorithms, \$98,000 Cisco Research Award, August 2007-August 2009.

Duchowski, A. and Westall, J. Design of Enhanced Reality Systems Augmented by Wireless Networks. \$10,500 Luminant LLC. August 2009 - May 2010.

Geist, R., Holliday, M. and Westall, J., REU supplements for CPATH EAE: TEXNH - Evaluation, Adoption, and Extension, \$16000, National Science Foundation, May 2010 - August 2010.

Schalkoff, R. and Westall, J., Assessment supplement for CPATH EAE: TEXNH - Evaluation, Adoption, and Extension, \$23,000, National Science Foundation, May 2010 - August 2011.

Geist, R. and Westall, J. IBM Faculty Award - Performance Modeling of Data Staging in Storage Hierarchies, \$38,000 IBM Corporation, October 2009 - October 2011.

Martin, J. and Westall, J. Broadcasting Video Content in Dense 802.11g Sports and Entertainment Venues; \$131,240. Cisco Systems, Inc. May 2010 - August 2011.

Geist, R. and Westall, J. Research in Tire and Track Modeling for Toyota NASCAR Teams, \$35,000 , Toyota Racing Development, May 2010.

TEACHING

Graduate Course Development

CPSC 825 - Software Systems for Data Communication (1985)

CPSC 826 - Internetworking (1998)

CPSC 853 - Implementation of TCP/IP Protocols (2005)

Graduate Students (Chair of Advisory Committee)

C. Zeringue, T. Ledford, R. Moss, M. Yang, D. Sikkema, M. Shuler, B. Starcher, S. Able, W. Hollis, J. Chern, J. Maybry, S. Palkar, L. Williams, B. Buddhavaparau, N. Deep, A. Sinha, S. Shrivastava, J. Baker, S. Moolky, T. Tatum, S. Bahadur, V. Ranjan, C. Freise, S. Hingorini, R. Bahukudumbi, N. Aerrabatu, H. Gilkey, M. Page, V. Kalyanakrishnan, A. Flower, S. Bhikshesvaran, S. Viswanathan, K. Spicer, I. Ahmed, V. Sharma, C. Bhasin, V. Mamidi, V. Manan, H. Gangani, V. Mamtan, M. Gokhale, A. Desai, H. Narendra, S. Pathak, V. Nagapraveen, P. Wells, R. Ramenini, N. Paul, T. Landry, E. Gosnell, A. Godavarthy, A. Patil, A. Tripathy, S. Drachova, A. Hussein, K. Padwal, A. Shah, G. Sreenivasan, K. Sadaram, R. Srivatsavai, V. Yalla, R. Bhat, R. Ligon, Y. Jayakumar, D. Bate