JOSEPH F. JAJA

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Academic Positions

1987 -	Professor of Electrical and Computer Engineering, and Permanent Member of the Institute for Advanced Computer Studies, University of Maryland, College Park.
2018 - 2022	Interim Chair, Department of Electrical and Computer Engineering, University of Maryland, College Park.
2014 - 2015	co-Technical Director, Cybersecurity FFRDC managed by MITRE Corporation.
2011 - 2013	Director of Cyberinfrastructure, Socio-Environmental Synthesis Center, Annapolis, MD.
2010 - 2011	Interim VP and CIO, University of Maryland, College Park.
1994 - 2004	Director, University of Maryland Institute for Advanced Computer Studies.
2000 - 2004	Interim Director, Center for Bioinformatics and Computational Biology.
1985 - 1994	Half-time appointment with the Institute for Advanced Computer Studies and the Institute for Systems Research, University of Maryland.
1988 - 1994	Associate Director for Research, Institute for Systems Research, University of Maryland.
1983 - 1987	Associate Professor of Electrical Engineering, University of Maryland.
1982 - 1983	Associate Professor of Computer Science, Pennsylvania State University.
1977 - 1982	Assistant Professor of Computer Science, Pennsylvania State University.
1976 - 1977	Teaching Assistant, Division of Engineering and Applied Physics, Harvard University.

Degrees

Ph.D. 1977, M.S. 1976, Applied Mathematics, Division of Engineering and Applied Physics, Harvard University
   Thesis: On the Algebraic Complexity of Classes of Bilinear Forms
   Advisor: Roger W. Brockett
B.S. 1974, with high distinction, Mathematics, American University of Beirut, Beirut, Lebanon

Selected Awards

- Maryland Industrial Partnerships Award of Excellence, 1992
- Co-authored a paper that won the Best Paper Award in Image Processing at Supercomputing '95
- IEEE Fellow Award, 1996
- 1997 R&D 100 Award for the development of S-Check at NIST which was recognized as one of 100 most technologically significant new products of the year by *R&D Magazine*.
- ACM Fellow, 2002.
- Internet2 Driving Exemplary Applications (IDEA) Award, given by the Internet2 consortium, for the project "Transcontinental Persistent Archives Prototype," in collaboration with Reagan Moore at SDSC and Robert Chadduck at NARA, April 2006.
- Scientific Visualization Best Paper Award for 2012: Hierarchical Exploration of Volumes using Multilevel Segmentation of the Intensity-Gradient Histograms, C. Yiu Ip, A. Varshney, and J. JaJa.
- Environmental Research Letters (Impact Factor: 4.134) – Best Article for 2016: Linking Toxic Outliers to Environmental Justice Communities, M. Collins, I. Munoz, and J. JaJa, Env. Res. Lett. 11, 2016.

Ph.D. Students

1. *Venkataraman Ashok*: The Complexity of Finding Disjoint Matchings in Graphs Subject to Various Optimizing Functions, 1982.

2. *Viktor Prasanna***:** Communication Complexity of Various VLSI Models, 1983.

3. *Jean Takche***:** On the Complexity of Bilinear Computations, 1983

4. *Sau Mou Wu***:** SYMBL: A New Boolean Compiler, 1987.

5. *Deepak Sherlekar* (co-advisor: Jack Minker): Graph Dissection Techniques for VLSI,1987.

6. *Alice Wu***:** Efficient Solutions for Several VLSI Routing Problems, 1988.

7. *Shing-Shong Chang***:** Parallel Algorithms for Several VLSI Routing Algorithms, 1988.

8. *Chaitali Chakrabarti***:** VLSI Architectures for Real-Time Signal Processing, 1990.

9. *Kwan Woo Ryu***:** Efficient Parallel Algorithms on the Network Model, 1990.

10. *Sridhar Krishnamurthy***:** On Designing Parallel Algorithms with Applications to VLSI Routing, 1992.

11. *Ravi Kolagolta***:** Design and Implementation of Systolic Architectures for Vector Quantization, 1992.

12. *Shu Sun Yu***:** Systolic Architectures for Signal Compression and Discrimination, 1994.

13. *Ying-Min Huang***:** Optimal Graph Algorithms on Linear Arrays, 1994.

14. *David Bader***:** On the Design and Analysis of Practical Parallel Algorithms for Combinatorial Problems with Applications to Image Processing, 1996.

15. *Hasan Fallaahadl***:** High Performance Computing Algorithms for Atmospheric Correction of Remotely Sensed Data, 1996.

16. *Po-Yueh Chen***:** VLSI Architectures for Adaptive Image Compression Using Discrete Wavelet Transform, 1997.

17. *David Helman***:** On the Design and Analysis of Practical Algorithms for Multiprocessor Architectures, 1998.

18. *Zengyan Zhang***:** Efficient Algorithms for Processing Remotely Sensed Imagery, 1998.

19. *Qingmin Shi***:** Efficient Data Management Techniques for Temporal and Spatial Data, 2003.

20. *Jusub Kim:* Efficient Rendering of Large 3-D and 4-D Scalar Fields, 2008.

21. *Qin Wang***:** New Algorithmic Techniques for Large Scale Volumetric Data Visualization on Parallel Architectures, 2008.

22. *Sangchul Song*: Long-Term Information Preservation and Access, 2010.

23. Zheng Wei, High Performance Computing Algorithms for Constructing Inverted Files on Emerging Multicore Processors, 2012.

24. Jing Wu, Optimization Techniques for Mapping Algorithms and Applications onto CUDA GPU Platform and CPU-GPU Heterogeneous Platforms, 2014.

25. Nattiya Seekhao (co-advisor: Nicole Yee-Key Li-Jensen), High-Performance Agent-Based Models with Real-Time In Situ Visualization of Inflmmatory and Healing Responses in Injured Vocal Folds, 2019

26. Chihuang Liu, Reliable Machine Learning: Robustness, Calibration, and Reproducibility, December 2021.

27. Manasij Venkatesh (co-advisor with Luiz Pessoa), Computing with Trajectories: Characterizing Dynamics and Connectivity in Spatio-Temporal Neuroimaging Data, 2020.

28. Jun Wang (co-advisor with Larry Davis), Deep Learning for Scene Perception and Understanding, Nov. 2022.

29. Yu Jin, Representation Learning for Large-Scale Graphs, July 2023.

30. Amit Kumar Kundu, in progress

31. Vaishnavi Sunil Patil, in progress

Publications

Books and Book Chapters

1. "New VLSI Architectures with Reduced Hardware" (with R. Owens), *Very Large Scale Integration*, ed. R. Bryant, Computer Science Press, pp. 351-379, 1983.

2. "Parallel and Pipelined VLSI Architectures Based on Decomposition" (with A. Kapoor), *VLSI Signal Processing II*, Kung, Owen and Nash, eds., pp. 177-187, 1986.

3. "Optimal Systolic Designs for the Computation of the Discrete Hartley and the Discrete Cosine Transforms" (with C. Chakrabarti), *VLSI Signal Processing III*, Brodersen and Moscovitz, eds., IEEE Press, 1988.

4. "Compiling Programs for Systolic Arrays" (with A. Athavale and R. Rowlett), *VLSI Signal Processing III*, Brodersen and Moscovitz, eds., IEEE Press, 1988.

5. *Frontiers of Massively Parallel Computation*, J. JáJá, ed., IEEE Press, 1990.

6. "VLSI Architectures for Template Matching and Block Matching" (with C. Chakrabarti), Chapter 1 in *Parallel Architectures and Algorithms for Image Understanding*, V.K. Prasanna Kumar, ed., Academic Press, 1990.

7. "Parallel Algorithms for VLSI Layout" (with S. Krishnamurthy), a chapter in *Advances in Distributed and Parallel Processing: Applications*, H. Tyrer, ed., Ablex Publishing Corporation, 1992.

8. *An Introduction to Parallel Algorithms*, Addison-Wesley, 1992.

9. "Fundamentals of Parallel Algorithms," a chapter in *Parallel and Distributed Computing Handbook*, A. Zomaya, ed., McGraw-Hill, 1996.

10. "Parallel Algorithms," a chapter in *Encyclopedia of Distributed Computing*," P. Dasgupta and J.E. Urban eds., Kluwer Academic Publishers, 1998.

11. "Parallel Random Access Machine, PRAM," in *Encyclopaedia of Mathematics*, M. Hazewinkel, ed., 2000.

12. "An Introduction to Clustering Techniques," a chapter in *Information Technology – Principles and Applications*, T. Acharya and A. K. Ray, eds., Prentice Hall, India, 2004.

13. "Parallel Algorithms for Volumetric Surface Construction," J. JaJa, Q. Shi, and A. Varshney, a chapter in *Parallel Computing: Models, Algorithms, and Applications*, S. Rajasekaran and J. Reif, eds., Chapman & Hall/CRC, 2008.

14. "Parallel Random Access Machines," J. JaJa, a chapter in Encyclopedia of Parallel Computing, David Padua ed., Springer, 2012.

Refereed Journals

1. Optimal Evaluation of Pairs of Bilinear Forms, *SIAM J. COMPT.*, 8(3):443-462, 1979.

2. Computation of Bilinear Forms over Finite Fields, *JACM*, 27(4):822-830, 1980.

3. On the Complexity of Bilinear Forms with Commutativity, *SIAM J. COMPT.*, 9(4): 713-728, 1980.

4. An Addendum to Kronecker's Theory of Pencils, *SIAM J. APPL. MATH.*, 37(3):700-712, 1979.

5. Evaluation of Arithmetic Expressions with Algebraic Identities, with T. Gonzalez, *SIAM J. COMPT.*, 11(4):622-633, 1982.

6. On the Complexity of Computing Bilinear Forms with {0,1} Constants, with T. Gonzalez, *JCSS*, 20(1):77-95, 1980.

7. Approximation Algorithms for Several Graph Augmentation Problems, with G. Frederickson, *SIAM J. COMPT.*, 10(2):170-183, 1981.

8. On the Relationship Between the Biconnectivity Augmentation and Traveling Salesman Problems, with G. Frederickson, *Theoretical Computer Science*, 19:189-201, 1982.

9. Fast, Efficient Parallel Algorithms for Some Graph Problems, with C. Savage, *SIAM J. COMPT.*, 10:682-690, 1981.

10. Some Space-Efficient Algorithms, with J. Simon, *Acta Informatica*, 17:411-423, 1982.

11. Parallel Algorithms in Graph Theory: Planarity Testing, with J. Simon, *SIAM J. COMPT.*, 11(2):314-328, 1982.

12. The Computational Complexity of a Set of Quadratic Functions, *JCSS*, 24:109-223, 1982.

13. Time-Space Tradeoffs for Some Algebraic Problems, *JACM*, 30(3):657-667, 1983.

14. Information Transfer in Distributed Computing with Applications to VLSI, with P. Kumar, *JACM*, 31(1):150-162, 1984.

15. The VLSI Complexity of Graph Problems, *JACM*, 31(2):377-391, 1984.

16. Improved Lower Bounds for Some Matrix Multiplication Problems, with J. Takche, *Information Processing Letters*, 21(3):123-127, 1985.

17. Information Transfer Under Different Sets of Protocols, with P. Kumar and J. Simon, *SIAM J. COMPT.*, 13(4):840-849, 1984.

18. Sorting with Reduced Hardware, with R. Owens, *IEEE Transactions on Computers*, C-33(7):668-670, 1984.

19. An Architecture for a VLSI FFT Processor, with R. Owens, *INTEGRATION: the VLSI Journal*, 1(4):305-316, 1983.

20. Sorting on Parallel Architectures with Serial Memories, with R. Owens, *IEEE Transactions on Computers*, C-34(4), 1985.

21. A VLSI Chip for the Winograd/Prime Factor Algorithm to Compute the Discrete Fourier Transform, with R. Owens, *IEEE Transactions on Acoustic, Speech and Signal Processing*, ASSP-34(4):979-989, 1986.

22. Lower bounds on Monotone Circuits with Restricted Depths, *International Journal of Computers and Mathematics with Applications*, 11(12):1155-1164, 1985.

23. On the Validity of the Direct Sum Conjecture, with J. Takche, *SIAM J. COMPT.*, 15(4):1004-1020, 1986.

24. Optimal Algorithms for Mesh-Connected Parallel Processors with Serial Memories, with R. Owens, *Advances in Computing Research*, 103-116, 1987.

25. A New Approach to Realize Partially Symmetric Functions, with S. Wu, *IEEE Transactions on Computers*, 38(6):896-898, 1989.

26. Parallel Algorithms for Planar Graph Isomorphism and Related Problems, with S. Rao Kosaraju, *IEEE CAS Transactions, Special Issue on Computational Graph Theory: Algorithms and Applications*, 35(3):304-311, 1988.

27. On Routing Two-Terminal Nets in the Presence of Obstacles, with A. Wu, *IEEE Transactions on CAD*, 8(5):563-570, 1989.

28. Optimal Algorithms for Adjacent Side Routing, with A. Wu, *Algorithmica*, 6(4), 1991.

29. Parallel Algorithms for Channel Routing in the Knock-Knee Model, with S. Chang, *SIAM J. COMPT.*, 20(2):228-245, 1991.

30. Efficient Algorithms for List Ranking and for Solving Graph Problems on the Hypercube, with K. Ryu, *IEEE Transactions on Parallel and Distributed Systems*, 1(1):83-90, 1990.

31. VLSI Architecture for Multi-dimensional Transforms, with C. Chakrabarti, *IEEE Transactions on Computers*, 40(9):1053-1057, 1991.

32. Systolic Architectures for the Computation of the Discrete Hartley and the Discrete Cosine Transforms, with C. Chakrabarti, *IEEE Transactions on Computers*, 39(11):1359-1368, November 1990.

33. Load Balancing and Routing Algorithms on the Hypercube and Related Networks, with K. Ryu, *Journal of Parallel and Distributed Computing*, 14(4):431-435, April 1992.

34. Parallel Algorithms for VLSI Routing, *INTEGRATION: The VLSI Journal*, 12(3):305-320, December 1991.

35. VLSI Implementation of a Tree Searched Vector Quantizer, with R. Kolagotla and S.S. Yu, *IEEE Transactions on Signal Processing*, 41(2):901-905, 1993.

38. Optimal Algorithms on the Pipelined Hypercube and Related Networks, with K.W. Ryu, *IEEE Transactions on Parallel and Distributed Systems*, 4(5):582-591, May 1993.

39. Top-Bottom Routing Around a Rectangle is as Easy as Computing Prefix Minima, with O. Berkman, S. Krishnamurthy, R. Thurimella, and U. Vishkin, *SIAM J. Computing*, 23(3):449-465, June 1994.

40. Systolic Architectures for Finite-State Vector Quantization, with R. Kolagotla and S. Yu, *Journal of VLSI Signal Processing*, 5:249-259, 1993.

41. VLSI Architectures and Implementation of Predictive Tree-Searched Vector Quantizers, with S.S. Yu and R. Kolagotla, submitted for publication to *IEEE Transactions on Circuits and Systems, Video Technology*.

42. Optimal unified architectures for the real-time computation of time-recursive discrete sinusoidal transforms, with K.J.R. Liu, C.T. Chiu, and R. Kolagotla, *IEEE Transactions on Circuits and Systems, Video Technology*, 4(2), 168-180, April 1994.

43. On the Difficulty of Mahattan Channel Routing, with S. Krishnamurthy and R. Greenberg, *Information Processing Letters*, 44(5), 281-284, 1992.

44. An Efficient Parallel Algorithm for the Single Function Coarsest Partition Problem, with Kwan Woo Ryu, *Theoretical Computer Science*, 129, 293-307, 1994.

45. Using Synthetic Perturbation Techniques for Tuning MIMD Programs, with R. Snelick, R. Kacker and G. Lyon, *Software Practice and Experience*, 24(8):679-701, August 1994.

46. Scalable Data Parallel Algorithms for Texture Synthesis and Compression using Gibbs Random Fields, with D. Bader and R. Chellappa, *IEEE Transactions on Image Processing*, 4(10):1456-1460, 1995.

47. Sorting Strings and Constructing Digital Search Trees in Parallel, with Kwan Woo Ryu and Uzi Vishkin, *Theoretical Computer Science*, 154:225-245, 1996.

48. Efficient Image Processing Algorithms on the Scan Line Array Processor, with D. Helman, *IEEE Transactions on PAMI*, 17(1):47-56, 1995.

49. Using Synthetic Perturbations and Statistical Screening to Assay Shared-Memory Programs, with R. Snelick, R. Kacker, and G. Lyon, *Information Processing Letters*, 54, 147-153, 1995.

50. The Block Distributed Memory Model, with K. Ryu, *IEEE Transactions on Parallel and Distributed Computing*, 7(8):830-840, 1996.

51. Guest Editors' Introduction: Special Issue on Data Parallel Algorithms and Programming, with Pearl Y. Wang, *Journal of Parallel and Distributed Computing*, 21, 1-3, 1994.

52. Parallel Algorithms for Image Histogramming and Connected Components with an Experimental Study, with David Bader, *Journal of Parallel and Distributed Computing*, 35(2):173-190, 1996.

53. An Optimal Randomized Parallel Algorithm for the Single Function Coarsest Partition Problem, with Kwan Woo Ryu, *Parallel Processing Letters*, 6(2):187-193, 1996.

54. Parallel Algorithms for Image Enhancement and Segmentation by Region Growing with an Experimental Study, with D. Bader, D. Harwood, and L. Davis, *Journal of Supercomputing*, 10(2):141-168, 1996.

56. Fast Algorithms for Removing Atmospheric Effects from Remotely Sensed Imagery, with H. Fallah-Adl, S. Liang, Y. Faufman, and J. Townshend, *IEEE Computational Science & Engineering*, 66-77, Summer 1996.

57. Fast Algorithms for Estimating Aerosol Optical Depth and Correcting Thematic Mapper Imagery, with H. Fallah-Adl and S. Liang, *The Journal of Supercomputing*, 10:315-329, 1997.

58. Development of an Operational Atmospheric Correction Algorithm for TM Imagery, with S. Liang, H. Fallah-Adl, S. Kalluri, Y. Kaufman and J. Townshend, *Journal of Geophysical Research, 102(D14):17, 173-17,186, July 1997.*

59. An On-Line Variable Length Binary Encoding of Text, with T. Acharya, *Informatics and Computer Science*, 94:1-22, 1996.

60. Practical Parallel Algorithms for Personalized Communication and Integer Sorting, with D. Bader and D. Helman, *ACM Journal of Experimental Algorithmics*, 1(3):1-42, 1996.

61. A Randomized Parallel Sorting Algorithm with an Experimental Study, with D. Helman and D. Bader, *Journal of Parallel and Distributed Computing*, 52(1):1-23, July 1998.

62. A New Deterministic Parallel Sorting Algorithm with an Experimental Evaluation, with D. Helman and D. Bader, *ACM Journal of Experimental Algorithmics*, December 1998.

63. High Performance Algorithms for Global BRDF Retrieval, Z. Zhang, S. Kalluri, J. JaJa, S. Liang, and J. Townshend, *IEEE Computational Science & Engineering*, 5(4):16-29, 1998.

64. High Performance Computing Algorithms for Land Cover Dynamics Using Remote Sensing Data, S. Kalluri, J. JaJa, D. Bader, Z. Zhang, J. Townshend, and H. Fallah-Adl, *International Journal of Remote Sensing*, 21(6), 1513-1536, 2000.

65. SIMPLE: A methodology for programming high performance algorithms on clusters of symmetric Multiprocessors, D. Bader and J. JaJa, *Journal of Parallel and Distributed Computing*, 58, 92-108, 1999.

66. Sorting on Clusters of SMPs, D. Helman and J. JaJa, *Informatica* 23:113-121, 1999.

67. Kronos: A Java-based software system for the processing and retrieval of large scale AVHRR data sets, Z. Zhang, J. JaJa, S. Kalluri, J. Townshend, and E. Vermote, *Photogrammetric Engineering and Remote Sensing,* 66(9), 1073-1082, 2000*.*

68. A perspective on Quicksort, J. JaJa, *Computing in Science and Engineering*, January/February 2000, 2(1), 43-49, 2000.

69. Prefix Computations on Symmetric Multiprocessors, D. Helman and J. JaJa, *Journal of Parallel and Distributed Computing*, 61(2), 265-278, Feb. 2001.

70. Characterizing Land Surface Anisotropy from AVHRR Data at a Global Scale Using High Performance Computing, S. Kalluri, Z. Zhang, J. JaJa, S. Liang, and J. Townshend, *International Journal of Remote Sensing*, 22(11), 2171-2191, 2001.

71. Multiscale Advanced Raster Map Analysis System: Definition, Design and Development, G. P. Patil, J. Balbus, G. Biging, J. JaJa, W. L. Myers, and C. Taillie, *Environmental and Ecological Statistics,*11(2), 113-138, June 2004.

72. Fast Algorithms for 3-D Dominance Reporting and Counting, Q. Shi and J. JaJa, *International Journal of Foundations of Computer Science*, 15(4), 673-684, August 2004.

73. A New Framework for Addressing Temporal Range Queries and Some Preliminary Results, Q. Shi and J. JaJa, *Theoretical Computer Science*, 332, 109-121, 2005.

74. Novel Transformation Techniques using Q-heaps with applications to computational geometry, Q. Shi and J. JaJa, *SIAM J. Computing*, 34(6), 1474-1492, 2005.

75. Optimal and Near-Optimal Algorithms for Generalized Intersection Reporting on Pointer Machines, Q. Shi and J. JaJa, *Information Processing Letters*, 95, 382-388, 2005.

76. Isosurface Extraction and Spatial Filtering Using Persistent Octree (POT), Q. Shi and J. JaJa, *IEEE Transactions on Visualization and Computer Graphics*, 12(5), September/October 2006.

77. An Efficient and Scalable Parallel Algorithm for Out-of-Core Isosurface Extraction and Rendering, Q. Wang, J. JaJa, A. Varshney, *Journal of Parallel and Distributed Computing*, 67(5), 592-603, 2007.

78. Interactive High-Resolution Isosurface Ray Casting on Multi-core Processors, Q. Wang and J. JaJa, *IEEE Transactions on Visualization and Computer Graphics*, 14(3), 603-614, May/June 2008.

79. Streaming Model Based Volume Ray Casting Implementation for Cell Broadband Engine, J. Kim and J. JaJa, *Scientific Programming: Special Issue on High-Performance Computing on the Cell BE*, Volume 17 (Number 1-2), 173-184, 2009.

80. Robust Tools and Services for Long-Term Preservation of Digital Information, J. JaJa and S. Song, *Library Trends Special Issue: Library of Congress National Digital Information and Preservation Partnership*, 57:3, 580-594, 2009.

81. Techniques to Audit and Certify the Long Term Integrity of Digital Archives, S. Song and J. JaJa, *International Journal on Digital Libraries*, volume 10 (2-3), 123-131, August 2009.

82. Interactive Direct Volume Rendering on Desktop Multicore Processors, Q. Wang and J. JaJa, *Concurrency and Computation: Practice and Experience*, 21, 2199-2212, September 2009.

83. An Optimized High-Throughput Strategy for Constructing Inverted Files, Z. Wei and J. JaJa, *IEEE Transactions on Parallel and Distributed Systems,* 23(11), 2033-2044, November, 2012.

84. A Fast Algorithm for Constructing Inverted Files on Heterogeneous Platforms, Z. Wei and J. JaJa, *Journal for Parallel and Distributed Computing*, 2013.

85. Optimization of Linked List Prefix Computation on Multithreaded GPUs using CUDA, Z. Wei and J. JaJa, *Parallel Processing Letters*, vol 22, No.04, December 2012.

86.   An Optimized FFT-based Direct Poisson Solver on CUDA GPUs, J. Wu, J. JaJa, and E. Balaras, *IEEE Transactions on Parallel and Distributed Systems*, 25(3), February 2014.

87.   Quantitative Analysis of F-Actin Redistribution in Astrocytoma Cells Treated with Candidate Pharmaceuticals, S. Locketts, C. Cui, P. Gudla, K. Nandy, J. JaJa, K. Eeilly, J. Beutler, and T. Turbyville, accepted to *Cytometry: Part A*.

88.   Optimized FFT Computations on Heterogeneous Platforms with Application to the Poisson Equation, J. Wu and J. JaJa, *Journal of Parallel and Distributed Computing*, 74(8), 2745-2756, August 2014.

89.   Connectivity-Based Brain Parcellation: A Connectivity-Based Atlas for Schizophrenia Research, Q. Wang, R. Chen, J. JaJa, L. Hong, and E. Herzkovits, *Neuroinformatics,* Oct. 2015, DOI 10.1007/s12021-015-9280-7..

90.   Achieving Native GPU Performance for Out-of-Card Large Matrix Multiplication, J. Wu and Joseph JaJa, *Parallel Processing Letters*, Volume 26, Number 2, June 2016.

91.   Linking Toxic Outliers to Environmental Justice Communities Across Broad Landscapes, M. Collins, I. Munoz, and J. JaJa, *Environmental Research Letters*., 11, 2016. Won the ERL **Best Article** for 2016 and selected to feature in the **Highlights of 2016** collection of Environmental Research Letters (ERL). .

92.   Dynamic Functional Network Analysis in Mild Traumatic Brain Injury, W. Hou, C. Sours, J. JaJa, R. Gullapalli, submitted to *Brain Research*.

93.   LEICA: Laplacian Eigenmaps for Group ICA Decomposition, C. Liu, J. JaJa, L. Pessoa, *Neuroimage, Vol* 169, 363-373, April 2018 (5-year impact factor: 6.943)..

94.   In Situ Visualization for 3D Agent-Based Vocal Fold Inflammation and Repair Simulation, N. Seekaho, J. JaJa, L. Mongeau, and N. Li-Jessen, *Supercomputing Frontiers and Innovations,* 4(3), 2017.

95.   High-Performance Agent-based Modeling Applied to Vocal Fold Inflammation and Repair, N. Seekhao, C. Shung, J. JaJa, L. Mongeau, and N. Li-Jessen, *Prontiers in Physiology: Computational Physiology and Medicine* (Impact Factor: 4.134), April 2018, Vol. 9, 20 pages.

96.   Brain Dynamics and Temporal Trajectories during Task and Naturalistic Processing, M. Venkatesh, J. JaJa, and L. Pessoa, *Neuroimage*, vol 186, Feb. 2019, 410-423.

97.   3D-Kernel Foveated Rendering for Light Fields, X. Meng, R. Du, J. JaJa, and A. Varshney, accepted, *IEEE Transactions on Visualization and Computer Graphics.*

98.   Dynamic Functional Network Analysis in Mild Traumatic Brain Injury, V. Hou, C. Rhodes, L. Jiang, S. Roys, J. Zhuo, J. JaJa, and R. Gullapalli, *Brain Connectivity*, 9(6). 2019.

99.   Analysis and Forecasting for Traffic Flow Data, Y. Wang and J. JaJa, *Sensors and Materials,* 31(6), 2143-2154, 2019.

100.   Towards a Physiological Scale of Vocal Fold Agent-based Models of Surgical Inquiry and Repair: Sensitivity Analysis, Calibration and Validation, A. Garg, S. Yuen, N. Seekhao, G. Yu, J. Karwowski, M. Powell, J. Sakata, L. Mongeau, J. JaJa, and N. Li-Jessen, *Applied Sciences*, 9(15), 2019.

101. *Comparing Functional Connectivity Matrices: A Geometry-Aware Approach applied to Participant Identification*, M. Venkatesh, J. JaJa, and L. Pessoa, *Neuroimage*, vol 207, Feb 2020.

102. *Learning Brain Dynamics for Decoding and Predicting Individual Differences*, J. Misra, S. Surampudi, M. Venkatesh, C. Limbachia, J. JaJa, and L. Pessoa, *PLOS Computational Biology,* 2021.

103. *HoloCamera: Advanced Volumetric Capture for Cinematic-Quality VR Applications*, J. Heagerty, S. Li, et. al., accepted to *IEEE Transactions on Visualization and Computer Graphics.*

Refereed Conferences

1. Optimal Evaluation of Pairs of Bilinear Forms, *Proceedings of the 1978 ACM Symposium on Theory of Computing*, San Diego, 173-183.

2. On the Complexity of Bilinear Forms with Commutativity, *Proceedings of the ACM Symposium on Theory of Computing*, Atlanta, 197-208, 1979.

3. Computing Arithmetic Expressions with Algebraic Identities is Hard, with T. Gonzalez, *Proceedings of the Conference on Information Sciences and Systems*, The Johns Hopkins University, Baltimore, 167-173, 1979.

4. Approximation Algorithms for Several Graph Augmentation Problems, with G. Frederickson, *Proceedings of the Allerton Conference on Communications, Control, and Computing*, pp. 470-479, 1979.

5. Some Space-Efficient Algorithms, with J. Simon, *Proceedings of the Allerton Conference on Communications, Control, and Computing*, 677-684, 1979.

6. Parallel Algorithms in Graph Theory: Planarity Testing, with J. Simon, *Proceedings of the MFC*, Poland, 1980.

7. Time-Space Tradeoffs for Some Algebraic Problems, *Proceedings of the ACM Symposium on Theory of Computing*, Los Angeles, 339-350, 1980.

8. On the Complexity of Some Problems Related to Edge Coloring, with V. Ashok, *Proceedings of the Conference on Information Science and Systems*, Princeton University, 571-574, 1980.

9. K-Coloring of Bipartite Graphs, with V. Ashok, *Proceedings of the Allerton Conference on Communications, Control, and Computing*, 1980.

10. Computation of Algebraic Functions with Root Extractions, *Proceedings of the Symposium on Foundations of Computer Science*, 95-100, 1981.

11. New VLSI Architectures with Reduced Hardware, with R. Owens, *Proceedings of the Cal Tech Conference on Very Large Scale Integration*, 351-378, March 1983.

12. On the Computational Complexity of the Permanent, *Proceedings of the Symposium on Foundations of Computer Science*, Tucson, Arizona, 312-319, 1983.

13. High-Speed Networks for Computing the Discrete Fourier Transform, *Proceedings of Advanced Research in VLSI*, MIT, 1984.

14. Identification Is Easier Than Decoding, *Proceedings of the Symposium on Foundations of Computer Science*, Portland, Oregon, 43-50, 1985.

15. SYMBL: An Optimized Layout System for Partially Symmetric Functions, with S. Wu, *Proceedings of the IEEE International Conference on Computer-Aided Design*, Santa Barbara, California, 370-374, 1986.

16. Layouts of graphs of arbitrary degree, with D. Sherlekar, *Proceedings of the 25th Annual Allerton Conference*, 355-364, September 1987.

17. Parallel Algorithms for River Routing, with S. Chang, *Proceedings of the International Parallel Processing Conference*, 9-13, 1988.

18. On Routing Two-Terminal Nets in the Presence of Obstacles, with A. Wu, *Proceedings of the Princeton Conference on Information Sciences and Systems*, 1988.

19. Parallel Algorithms for Wiring Module Pines to Frame Pads, with S. Chang, *Proceedings of the International Parallel Processing Conference*, vol. III, 102-105, 1989.

20. Parallel Algorithms for Channel Routing in the Knock-Knee Model, with S. Chang, *Proceedings of the International Parallel Processing Conference*, 18-25, 1988.

21. Optimal Systolic Designs for the Computation of the Discrete Hartley and the Discrete Cosine Transforms, with C. Chakrabarti, *Proceedings of the IEEE VLSI Signal Processing Workshop*, 411-422, 1988.

22. Compiling Programs for Systolic Arrays, with A. Athavale and J.R. Rowllet, *Proceedings of the IEEE VLSI Signal Processing Workshop*, 509-522, 1988.

23. Optimal Architectures for Multi-dimensional Transforms, with C. Chakrabarti, *Proceedings of the Allerton Conference on Communications, Control, and Computing*, 1988.

24. Provably Good Parallel Algorithms for Channel Routing of Multi-Terminal Nets, with S. Krishnamurthy, *Proceedings of Frontiers on Massively Parallel Computation*, 177-180, 1988.

25. Optimal Mesh Algorithms for Routing, with S. Chang, *Proceedings of Frontiers on Massively Parallel Computation Conference*, 125-128, 1988.

26. List Ranking on the Hypercube, with K. Ryu, *Proceedings of the International Parallel Processing Conference*, vol. III, 20-23, 1989.

27. Embedding Graphs in Binary Trees, with D. Sherlekar, *The 1989 ICCI Conference-Selected Papers*, 111-117, North Holland, June 1989.

28. VLSI Architecture for Template Matching, with C. Chakrabarti, Proceedings of 1990 ISCAS.

29. Parallel Algorithm for 2-D Template Matching on a SIMD Mesh Connected Computer, with C. Chakrabarti, Proceedings of the *International Conference on Pattern Recognition*, 1990.

30. Load Balancing and Routing Algorithms on the Hypercube and Related Networks, with K. Ryu, *Proceedings of the 1990 International Parallel Processing Conference*, August 1990.

31. Parallel Algorithms for VLSI Routing, invited talk at the *First Annual Workshop on Parallel Algorithms*, May 1990, Annapolis, Maryland.

32. Some triply-logarithmic parallel algorithms, with O. Berkman, S. Krishnamurthy, R. Thurimella, and U. Vishkin, *Proceedings of the 1990 Foundations of Computer Science*, St. Louis, Missouri, October 1990, 871-881.

33. VLSI Routing on the Pipelined Hypercube, *Proceedings of the First Annual Great Lakes Symposium on VLSI*, 7-11, March 1991, Kalamazoo, Michigan.

34. Systolic Architectures for Finite-State Vector Quantization, with R. Kolagotla and S.S. Yu, *Proceedings of the 1992 International Conference on Applications-Specific Array Processors*.

35. VLSI Implementation of Real-Time Parallel DCT/DST Lattice Structures for Video Communications, with C.T. Chiu, R.K. Kolagotla, K.J.R. Liu, *Proceedings of 1992 IEEE Workshop on VLSI Signal Processing*.

36. VLSI Architectures and Implementation of Predictive Tree-Searched Vector Quantizers for Real-Time Video Compression, with S.S. Yu and R. Kolagotla, *Proceedings of the 1992 IEEE Workshop on VLSI Signal Processing*.

37. Optimal Unified Architectures for Time-Recursive Discrete Sinusoidal Transforms, with K.J.R. Liu, C.T. Chiu and R. Kolagotla, *Proceedings of the 1993 ICASSP*.

38. An Efficient Parallel Algorithm for the Single Function Coarsest Partition Problem, with K.W. Ryu, *Proceedings of the 1993 Symposium on Parallel Algorithms and Architectures*.

39. Optimal Unified IIR Architectures for Time-Recursive Discrete Sinusoidal Transforms, with K.J.R. Liu, C.T. Chiu and R.K. Kolagotla, *Proceedings of the 1993 Conference on Information Sciences and Systems*, Johns Hopkins University, March 1993.

40. Optimal Algorithms on Fixed-Size Linear Arrays, with Ying-Min Huang, *Proceedings of the 1993 Conference on Information Sciences and Systems*, Johns Hopkins University, March 1993.

41. Efficient Image Processing Algorithms on the Scan Line Array Processor, with D. Helman, *Proceedings of the 1993 International Conference on Parallel Processing*, St. Charles, Illinois, August 1993.

42. Using Synthetic Perturbation Techniques for Tuning Shared Memory Programs, with R. Snelick, R. Kacker and G. Lyon, *Proceedings of the 1993 International Conference on Parallel Processing*, St. Charles, Illinois, August 1993.

43. Sorting Strings and Constructing Digital Search Trees in Parallel, with K. Ryu and U. Vishkin, *Proceedings of the 1994 International Parallel Processing Symposium*, Cancun, Mexico, April 1994.

44. The Block Distributed Memory Model for Shared Memory Multiprocessors, with K. Ryu, *Proceedings of the 1994 International Parallel Processing Symposium*, Cancun, Mexico, April 1994.

45. Parallel Algorithms for Image Histogramming and Connected Components with an Experimental Study, with D. Bader, *Proceedings of the Fifth ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming*, 123-133, Santa Barbara, California, July 1995.

46. An Optimal Ear Decomposition with Applications on Fixed-Size Linear Arrays, with Ying-Min Huang, *International Conference on Parallel Processing*, vol. III, 97-104, Oconomowoc, Wisconsin, 1995.

47. Land Cover Dynamics Investigation Using Parallel Computers, with S. Liang et al., *Proceedings of IGARSS '95*, July 1995.

48. Efficient Algorithms for Atmospheric Correction of Remotely Sensed Data, with H. Fallah-Adl, S. Liang, Y. Kaufman and J. Townshend, *Proceedings of the 1995 Supercomputing Conference*, San Diego, December 1995 (Won Best Student Paper Finalist Award in the area of Image Processing at SUPERCOMPUTING '95).

49. Practical Parallel Algorithms for Dynamic Data Redistribution, Median Finding, and Selection, with D. Bader, *Proceedings of the 10th International Parallel Processing Symposium*, Honolulu, Hawaii, April 1996.

50. Parallel Algorithms for Image Enhancement and Segmentation by Region Growing with an Experimental Study, with D. Bader, D. Harwood, and L. Davis, *Proceedings of the 10th International Parallel Processing Symposium*, Honolulu, Hawaii, April 1996.

51. Parallel Algorithms for Personalized Communication and Sorting with an Experimental Study, with D. Helman and D. Bader, *Proceedings of the 1996 Symposium on Parallel Algorithms and Architectures*, 211-222, 1996.

52. Sequential and Parallel Algorithms for Estimating Atmospheric Parameters for Surface Reflectance Retrieval, *Proceedings of the International Conference on Parallel Processing*, 1996.

53. An On-line Variable Length Binary Encoding to Enhance the Ziv-Lempel Codes, with T. Acharya, *ICCI '96*.

54. Retrieval of Bidirectional Reflectance Distribution Function (BRDF) at Continental Scales from AVHRR Data Using High Performance Computing, *IGARSS Symposium*, August 1997.

55. Sorting on Clusters of SMPs, with D. Helman, International Parallel Processing Symposium, April 1998.

56. Designing Practical Efficient Algorithms for Symmetric Multiprocessors, with D. Helman, *Proceedings of the Workshop on Algorithm Engineering and Experimentation* sponsored by DIMACS, January 1999.

57. Prefix Computation on Symmetric Multiprocessors, with D. Helman, *Proceedings of the International Parallel Processing Symposium*, 1999.

58. A hierarchical data archiving and processing system to generate custom tailored products from AVHRR data, with Kalluri, Zhang, Bader, Song, El Saleous, Vermonte, and Townshend, *Proceedings of the 1999 IGARSS Symposium*.

59. Retrieval of Global Broad Band Albedo from AVHRR data using High performance Computing Techniques, with Kalluri, Zhang and Townshend, *Proceedings of the 1999 IGARSS Symposium*.

60. Web Based Progressive Transmission for Browsing Remotely Sensed Imagery, M. Mareboyana, S. Srivastava, and J. JaJa, Proceedings of the 2000 IGARSS Symposium.

61. MOCHA: A database middleware system featuring automatic deployment of specific functionality, N. Roussopoulos, J. McGann, S. Kelley, V. Katz, Z. Song, and J. JaJa, *Proceedings of the ACM SIGMOD International Conference*, May 16-18, 2000.

62. Efficient Techniques for Range Search Queries on Earth Science Data, Q. Shi and J. JaJa, *Proceedings of the 2002 International Conference on Scientific and Statistical Database Management*, July 2002.

63. Fast Algorithms for 3-D Dominance and Counting, Q. Shi and J. JaJa, *Proceedings of the 2003 IASTED International Conference on Computer Science and Technology*, May 2003.

64. Fast Algorithms for a Class of Temporal Range Queries, Q. Shi and J. JaJa, *Proceedings of the Workshop on Algorithms and Data Structures*, July 30- August 1, 2003, Ottawa, Canada, 91-102.

65. Temporal Range Exploration of Large Scale Multidimensional Time Series Data, J. JaJa, J. Kim, and Q. Wang, *Proceedings of the 2004 International Conference on Scientific and Statistical Database Management*, 95-106, June 2004, Santorini Island, Greece.

66. Techniques for Indexing and Querying Temporal Observations for a Collection of Objects, Q. Shi and J. JaJa, *Proceedings of the 2004 Annual Symposium on Algorithms and Computation*, 822-834, December 2004, Hong Kong.

67. Space Efficient and Fast Algorithms for Multidimensional Dominance Reporting and Counting, J. JaJa, C. Mortensen, Q. Shi, *Proceedings of the 2004 Annual Symposium on Algorithms and Computation*, 558-568, December 2004, Hong Kong.

68. Scalable, Reliable Marshalling and Organization of Distributed Large Scale Data Onto Enterprise Storage Environments, J. JaJa, M. Smorul, F. McCall, and Y. Wang, *Proceedings of the NASA/IEEE Conference on Mass Storage Systems and Technologies*, April 2005, Monterey, CA.

69. Mitigating Risk of Data Loss in Preservation Environments, R. Moore, J. JaJa, and R. Chadduck, *Proceedings of the NASA/IEEE Conference on Mass Storage Systems and Technologies*, April 2005, Monterey, CA.

70. Using Scalable and Secure Web Technologies to Design a Global Digital Format Registry Prototype: Architecture, Implementation, and Testing, M. Geremew, S. Song, and J. JaJa, to appear in *Proceedings of the Archiving 2006 Conference*, May 23-26, 2006, Ottawa, Canada.

71. An Efficient and Scalable Parallel Algorithm for Out-of-Core Isosurface Extraction and Rendering, Q. Wang, J. JaJa, A. Varshney, *Proceedings of the International Parallel and Distributed Processing Symposium* (IPDPS'2006), April 2006, Rhodes Island, Greece.

72. Robust Technologies for Automated Ingestion and Long-Term Preservation of Digital Information, *Proceedings of the 7th Annual International Conference on Digital Government Research*, 285-287, May 21-24, 2006, San Diego, CA.

73. Supporting Customized Archival Practice Using the Producer-Archive Workflow Network (PAWN), M. Smorul, M. McGann, and J. JaJa, *Proceedings of DigCCurr2007*, an International Symposium in Digital Curation, Chapel Hill, NC, April 18-20, 2007.

74. ACE: A Novel Software Platform to Ensure the Integrity of Long Term Archives, S. Song and J. JaJa, 90-93, *Proceedings of the Archiving 2007 Conference*, May 2007, Washington, DC.

75. PAWN: a Policy-Driven Software Environment for Implementing Producer-Archive Interactions in Support of Long Term Digital Preservation, M. Smorul, M. McGann, and J. JaJa, 84-89, *Proceedings of the Archiving 2007 Conference*, May 2007, Washington, DC.

76. New Techniques for Ensuring the Long Term Integrity of Digital Archives, Sangchul Song and Joseph JaJa, *Proceedings of the 8th Annual International Conference on Digital Government Research*, 57-65, Philadelphia, May 20-23, 2007.

77. Component-based Data Layout for Efficient Slicing of Very Large Multidimensional Volumetric Data, Jusub Kim and Joseph JaJa, *Proceedings of the 2007 International Conference on Scientific and Statistical Database Management,* July 9-11, 2007, Banff, Canada.

78. Information Aware Tree for Efficient out-of-core Indexing of Very Large Multidimensional Volumetric Data, Jusub Kim and Joseph JaJa, *Proceedings of the 2007 International Conference on Scientific and Statistical Database Management,* July 9-11, 2007, Banff, Canada.

79. Streaming Model Based Volume Ray Casting Implementation for Cell Broadband Engine, Jusub Kim and Joseph JaJa, *Eurographics Symposium on Parallel Graphics and Visualization*, 2008.

80. Quantification of F-Actin Structures in Astrocytoma Cells in Response to Candidate Pharmaceuticals, C. Chi, T. Turbyville, P. Gudla, K. Nandy, J. Beutler, J. JaJa, and S. Lockett, MIAAB'08, NYC, USA.

81. Quantification of F-actins Structures in Astrocytoma Cells in Response to Candidate Pharmaceuticals, C. Cui, T. Turbyville, P. Gudla, K. Nandy, J. Beutler, J. JaJa, and S. Lockett, Focus on Microscopy, 2009.

82. Quantifying the astrocytoma cell response to candidate pharmaceutical from F-ACTIN image analysis, Chi Cui, Joseph JaJa, Thomas Turbyville, John Beutler, Prabhakar Gudla, Kaustav Nandy and Stephen Lockett, EMBC, 2009, Minneapolis, Minnesota

83. Search and Access Strategies for Web Archives, S. Song and J. JaJa, *Proceedings of Archiving 2009*, 73 – 78, May 4-7, 2009, Arlington, VA.

84. A Case Study in Distributed Collection Monitoring and Auditing Using the Audit Control Environment (ACE), M. Smorul and J. JaJa, *Proceedings of Archiving 2009*, 183-186, May 4-7, 2009, Arlington, VA.

85. Optimization of Linked List Prefix Computations on Multithreaded GPUs Using CUDA, Zheng Wei and Joseph JaJa, *Proceedings of the 2010 IPDPS*, Atlanta, Georgia, April 2010.

86. Monitoring Distributed Collections Using the Audit Control Environment (ACE), M. Smorul, S. Song, and J. JaJa, *Proceedings of the 2010 Roadmap for Digital Preservation Interoperability Framework Workshop*, Gaithersburg, MD, March 29-31, 2010.

87. Implementation of a High Performance Architecture for Managing and Storing Web-Harvested Collections, Mike Smorul and Joseph JaJa, *Archiving 2011*.

88. A Fast Algorithm for Constructing Inverted Files on Heterogeneous Platforms, Zheng Wei and Joseph JaJa, *Proceedings of the 2011 IPDPS*, Alaska, May 2011.

89. Optimized Strategies for Mapping Multi-dimensional FFTs onto GPUs, J. Wu and J. JaJa, accepted *to Innovative Parallel Computing (INPAR) Workshop*, San Jose, CA, May 13-14, 2012.

90. Candidate Pharmaceuticals Quantitatively Redistribute F-Actin In Astrocytoma Cells, S. Lockett, C. Cui, T. Turbyville, P. Gudla, K. Nandy, J. JaJa, K. Reilly, and J. Beutler, accepted to *International Society for Analytical Cytometry (ISAC),* Liepzig, Germany, June 23-27, 2012.

91. Access, Visualization and Statistical Tools for the Analysis of North America Butterfly Monitoring Data, L. Ries, J. JaJa, M. Smorul, J. Glassberg, D. Taron, B. Fagan, and J. Sauer, *Ecological Society of America (ESA)* Conference, 2012.

92. Candidate Pharmaceuticals Quantitatively Redistribute F-Actin in Astrocytoma Cells, S. Lockett, T. Turbyville, P. Gudla, K. Nandy, C. Cui, J. JaJa, K. Reilly, and J. Beutler, *Functional Imaging for Regenerative Medicine*, Joint NIST/NIH/NSF Workshop, May 31 – June 1, 2012, Gaithersburg, MD.

93. Hierarchical Exploration of Volumes using Multilevel Segmentation of the Intensity-Gradient Histograms, C. Yiu Ip, A. Varshney, and J. JaJa, *Visualization 2012*, Oct. 14-19, Seattle, WA, 2012 (Won the *Scientific Visualization Best Paper Award* for 2012).

94. High Performance FFT Based Poisson Solver on a CPU-GPU Heterogeneous Platform, J. Wu and J. JaJa, *Proceedings of the 2013 IPDPS*, Boston, MA., May 20-25, 2013.

95. From Maxout to Channel-Out: Encoding Information on Sparse Pathways, Q. Wang and J. JaJa, Proceedings of the International Conference on Artificial Neural Networks, Hamburg, Germany, September 15-19, 2014.

96. Resting State Dynamic Functional Network Analysis in Mild Traumatic Brain Injury, W. Hou, C. Sours, J. JaJa, and R. Gullapalli, *International Society for Magnetic Resonance in Medicine ISMRN 2015*, Toronto, Ontario, May 30—31, 2015.

97. A Computational Update of Agent-Based Computer Models of Vocal Fold Inflammation and Repair, N. Seekhao, C. Shung, J. JaJa, L. Mongeau, and N. Y. K. Li, 11th PEVOC, Florence, Italy, August 31- September 4, 2015.

98. A Data-Driven Approach to Extract Connectivity Structures from Diffusion Tensor Imaging Data, Y. Jin, J. JaJa, R. Chen, and E. Horskovits, Proceedings of the 2015 IEEE International Conference on Big Data (IEEE BigData 2015), Oct 29 – Nov 1, 2015, Santa Clara, CA.

99. Sensitivity Analysis of Agent-Based Model of Vocal Fold Inflammation and Repair, Trickey, K, Shung, C., Yuen, S., Seekhao, N., , JaJa, J., Mongeau, L. 2, Li, N. Y. K. , accepted to 2016 International Conference on Voice Physiology and Biomechanics, Vina del Mar, Chile, March 14-17, 2016.

100. Real-time Agent-Based Modeling Simulation with in-situ Visualization of Complex Biological Systems: A Case Study on vocal fold Inflammation and Healing, N. Seekhao, C. Shung, J. JaJa, L. Mongeau, and N. Li, Proceedings of the HiCOMB 2016 Workshop, May 2016, Chicago.

101. A High Performance Implementation of Spectral Clustering on CPU-GPU Platforms, Y. Jin and J. JaJa, *Proceedings of the Parallel Computing and Optimization* (PCO 2016), May 2016, Chicago.

102. In-Situ Visualization for 3D Agent-Based Vocal Fold Inflammation and Repair Simulation, N Seekhao, J. JaJa, L Mongneau, and Nicole Li-Jessen, *ISC Workshop on In Situ Visualization*, June 22, 2017, Frankfort, Germany.

103. High-Performance Host-Device Scheduling and Data-transfer Minimization Techniques for Visualizaiton of 3D Agent Based Wound Healing applications, N. Seekhao, G. Yu, S. Y., J. JaJa, L. Mongeau, and N. Li-Jessen, to appear in the *25th International Conference on Parallel and Distributed Processing Techniques and Applications*, July 29 – August 1, 2019, Las Vegas.

104. Feature Prioritization and Regularization Improve Standard Accuracy and Adversarial Robustness, C. Liu and J. JaJa, Proceedings of the *International Joint Conference on Artificial Intelligence (IJCAI)*, August 10-16, 2019, Macao, China.

105. Geodesic Distances between Functional Connectivity Matrices: a Geometry-aware Approach, M. Venkatesh, J. JaJa, and L. Pessoa, Poster Presentation, *Neuroscience 2019*, October 19-23, Chicago, IL.

106. Graph Coarsening with Preserved Spectral Properties, Y. Jin, A. Loukas, and J. JaJa, Proceedings of the 23rd International Conference on Artificial Intelligence and Statistics (AISTATS 2020).

107. Class-Similarity Based Label Smoothing for Confidence Calibration, C. Liu and J. JaJa, Proceedings of the 30the International Conference on Artificial Neural Networks (ICANN'2021), 2021.

108. FedNet2Net: Saving Communication and Computations in Federated Learning with Model Growing, A. Kundu and J. JaJa, *International Conference on Artificial Neural Networks (ICANN)*, September 2022.

109. DOT-VAE: Disentangling One Factor at a Time using Variational Autoencoders, V. Patil, M. Evanusa, J. JaJa, *International Conference on Artificial Neural Networks (ICANN)*, September 2022.

110. Improving Graph Neural Networks with Learnable Pooling, Y. Jin and J. JaJa, *2022 IEEE Conference on Data Mining Workshops*, Nov. 28 – Dec 1, 2022, Orlando, FL.

111. TAG: Boosting Text-VQA via Text-aware Visual Question-answer Generation, J. Wang, M. Gao, Y. Hu, F. Selvaraju, C. Ramaiah, R. Xu, J. JaJa, and L. Davis, *Proceedings of the BMVC 2022*, Nov. 21-24, London, UK.

112. ProtoVAE: Prototypical Networks for Unsupervised Disentanglement, V. Patil, M. Evanusa, and J. JaJa, 2023, arXiv.2305.09092 https://arxiv.org/abs/2305.09092

113. HoloCamera: Advanced Volumetric Capture for Cinematic-Quality VR Applications, J. Heagerty, S. Li, et. al., accepted to IEEE VR 2024.

Invited Talks at Conferences and Workshops

1. The VLSI Complexity of Graph Problems, *International Symposium on Circuits and Systems*, Special Session on Computational Graph Theory, 1985, Kyoto, Japan.

2. Parallel Algorithms for VLSI Routing, *First Annual Workshop on Parallel Algorithms*, May 1990, Annapolis, Maryland.

3. VLSI Routing on the Pipelined Hypercube, *First Annual Great Lakes Symposium on VLSI*, March 1991, Kalamazoo, Michigan.

4. Optimal Parallel Algorithms on the Network Model, *Seventh Clemson Discrete Math Mini-Conference*, October 1992, Clemson, South Carolina.

5. Issues on the Algorithm-Software Continuum, Panel, *Frontiers on Massively Parallel Computation*, October 1992, McLean, Virginia.

6. Designing Efficient Parallel Algorithms: Models and Paradigms with Applications to Image Processing, *International Parallel Processing Symposium*, April 1993, Newport Beach, California.

7. In Search of a Universal (But Useful) Model of Parallel Computation, Panel, *International Conference on Parallel Processing*, August 1993, St. Charles, Illinois.

8. The Block Distributed Memory Model: Algorithms and Experimental Results, *Workshop on Algorithms and Future Technologies '95*, March 1995, Prague.

9. Challenges for Parallel Processing, Parallel Models, Panel, *International Conference on Parallel Processing*, August 1996, Bloomingdale, Illinois.

10. Geospatial Data Management and Mining, *Information Sciences and Technology Colloquium*, NASA Goddard Space Flight Center, Oct. 2000.

11. On Computation Models for Clusters of SMPS, keynote address at the *Workshop on Models for Parallel Computation*, *IPDPS01*, April 2001, San Francisco, CA.

12. A Scaleable Infrastructure for Browsing, Processing, and Fusing Distributed Heterogeneous Earth Science Data, a keynote address at the *Thirteenth International Conference on Scientific and Statistical Database Management*, July 2001.

13. Efficient Techniques for Exploring Geosptial Data, Distinguished Lecture Series, University of New Mexico, Nov. 2001.

14. Information Discovery and Data Grids: Technologies for Enhancing Geospatial Data Access, *EOSDIS Data Access Technology Workshop*, Oct. 2002.

15. Strategies for Exploring Large Scale Data, *International Symposium on Parallel Architectures, Algorithms and Networks*, May 10-12, 2004, Hong Kong, China.

16. PAWN: A Novel Ingestion Workflow Technology for Digital Preservation*, ERPANET Workshop on Workflow*, Oct 13-15, 2004, Budapest, Hungary (given by Mike Smorul).

17. Efficient Algorithms for Exploring Large-Scale Time Varying Data, invited talk at the Distinguished Lecture Series, Iowa State University, March 21, 2005.

18. Robust Tools for Archiving and Preserving Digital Assets, in session: Digital Asset Management: Implications for Preservation, *2007 ALA Annual Conference*, Saturday, June 23, 2007, Washington, D.C.

19. Large Scale Scientific Visualization on Multicore Processors, Fifth *International Conference   of Applied Mathematics and Computing*, August 12-18, 2008, Plovdiv, Bulgaria.

20. Large Scale Scientific Visualization on Multicore Processors, *Frontiers of Multicore Computing Workshop*, August 26-28, 2008, UMBC, Baltimore, Maryland.

24. Tools and Services for Long-Term Preservation of Digital Archives, *Indo-US Workshop on International Trends in Digital Preservation*, March 24-25, 2009, Pune, India .

25. Novel Scalable Computational Techniques for Exploring Structural Brain Organization, Invited Keynote Presentation at the *International Conference on Contemporary Computing (IC3),* Nodia, India, August 11-13, 2016.

Grants

1. NSF Grant No. MCS 78-06118 (July 1978), Complexity of Bilinear Forms, $5,900

2. Pennsylvania State University ACOR Research Initiation Grant (July 1979), Research on Bilinear Forms, $4,252

3. NSF Grant No. MCS 78-27600 (May 1979), Complexity of Bilinear Forms, $28,427

4. U.S. Army Research Office, Contract No. DAAG 29-82-K-0110 (May 1982), Distributed and Parallel Systems (with Janos Simon), $166,200

5. Investigator in ONR Grant No. N00014-80-C-0517 (July 1982), Fundamental Research Initiative: Signal Processing (with J. Irwin, R. Owens, and J. Simon), $120,000

6. NSF Grant No. MCS 82-18580 (May 1983), The Complexity of Algebraic Problems, $86,403

7. NSF Grant No. MCS 83-15890 (August 1983), The Complexity of Algebraic Problems, $75,000

8. Army Research Office, Contract No. DAAG 29-82-K-0110 (August 1983), Distributed and Parallel Systems, $47,000

9. Army Research Office, Contract No. DAAG 29-82-K-0110 (August 1984), Distributed and Parallel Systems, $80,000

10. NSA Grant No. MDA-904-85H-0015 (June 1985), Circuits and Systems Design in VLSI (with H. C. Lin and G. Blankenship), $255,000

11. NSA Grant No. MDA-904-85H-0015 (June 1986), Circuits and Systems Design in VLSI (with H. C. Lin), $258,499

12. NSA Grant No. MDA-904-85H-0015 (June 1987), Circuits and Systems Design in VLSI (with H. C. Lin), $297,510

13. NASA Contract No. NAG-776 (May 1986), Research on Designing a 256-Processor Chip for the Massively Parallel Processor, $98,233

14. NSF Grant No. DCR-86-00378 (June 1986), Complexity of Algebraic Problems, $150,953

15. Sperry Reston, Research in Parallel and Distributed Architectures for Detection, Estimation and Real Time Signal Processing (with J. Baras) (1987), $120,000

16. Unisys Corporation, VLSI Building Blocks for Digital Signal Processing (January 1988), $60,000

17. Ford Aerospace Corporation (MIPS), VLSI Design and Implementation of Data Compression Schemes (with N. Farvardin) (1989), $100,000

18. U.S. Department of Commerce (NIST), Contract No. 60NANB9D0915 (January 1989), VLSI Hardware for Performance Measurements of MIMD Architecture, $24,090

19. NSF Grant No. CDA-89-07195 (August 1989), Reconfigurable Distributed Computing Environment for High-Performance Applications (with B. Menezes), $199,931

20. Ford Aerospace Corporation (MIPS), (January 1990) VLSI Design and Implementation of Data Compression Schemes, $76,056

21. Associated Enterprises, Inc. (MIPS), Using Baudot or ASCII Signalling Through FM Radio for Users of TDDS (with E. Geraniotis) (August 1991), $104,527

22. Systems Research Center (June 1991-1992), Real Time Signal Processing and Understanding (with Baras, Berenstein, Farvardin, Lui, Hendler, and Shamma), $217,001

23. NSF Grant No. CCR-9103135 (December 1991-June 1995), Efficient Parallel Algorithms, $169,759

24. Systems Research Center (June 1992-June 1993), Real Time Signal Processing and Understanding (with Baras, Berenstein, Farvardin, Lui, Hendler, and Shamma), $223,698

25. NASA NGT-50951 (1992-1996), Graduate Student Fellowship, $88,000

26. Associated Enterprises, Inc. (MIPS), Using Baudot or ASCII Signalling through FM Radio for Users of TDDs (with E. Geraniotis) (February 1994), $83,907

27. NSF Grant (October 1993-1998), High Performance Computing for Land Cover Dynamics, L. Davis (PI) (with Townshend, Chellappa, Lawrence, Roussopoulos, Saltz, and Samet), $2,999,997

28. NSF Grant No. CDA9512621 (August 15, 1995-July 31, 1998), Acquisition of an ATM Network, JáJá (PI), Agrawala (co-PI), Fajman (co-PI), Goward (co-PI), Keleher (co-PI), Maddocks (co-PI), and Roussopoulos (co-PI), $390,276.

29. NSF Grant No. 960725-8037 (November 15, 1996-October 31, 1999), Connecting the University of Maryland to vBNS, J. JáJá (PI) and J. Fajman (co-PI), with an increment of $259,200.

30. NSF Grant No. CCR-9627210 (July 1996-June 1998), Research on Designing Parallel Algorithms, J. JáJá (PI), $181,899.

31. MDA90497C3015, Performance and Management of Distributed Heterogeneous Networks (February 24, 1997-February 23, 1999), $696,596.

32. MDA90497C3015, DOD-NSA, Performance and Management of Distributed Heterogeneous Networks, Increment, J. JaJa (PI), $497,786, 1998-1999.

33. National Partnership for Advanced Computational Infrastructure - University of California at San Diego, Co-PI, NSF, Dr. JaJa's efforts are funded at the level of 220K-250K/year (1997-2004).

34. NASA, NAG56617, Advanced Center for Global Remote Sensing Studies, J. JaJa (PI) and J. Townshend (co-PI), $430,000, 1997-2000.

35. NASA, A Landcover Earth Science Information Partnership, co-PI with J. Townshend (PI), $4.711M, 1998-2002. Additional funding of $275K until June 30, 2003.

36. MDA90499C2521, Telecommunications and Information Systems Security, J. JaJa (PI) (January 1999-January 2000), $1,050,000.

37. NSF, Collaborative Education and Research Initiative (subcontract to Bowie State University), J. JaJa (PI) and L. Davis (co-PI), $284,558, 9/15/99-8/31/02.

38. NARA, Persistent Digital Archives (subcontract to San Diego Supercomputer Center), J. JaJa (co-PI), $150K (6/1/00-5/30/02).

39. DoD-NSA, Performance and Management of Distributed Heterogeneous Networks (J. JaJa (PI), $1,549,063 (2000-2001).

40. NASA Federation SEEDS: ESIP Data Grid, J. JaJa (PI) with J. Townshend (co-PI) and Reagan Moore (co-PI, SDSC), $120K (September 2003 – November 2004).

41. NARA, Development of a Prototype Persistent Archive of Current NARA Digital Holdings and other Records Collections, subcontract to San Diego Supercomputer Center, J. JaJa (co-PI), $749,188 (6/1/02-5/31/05). FY05 Increment: $350,000, FY06 Increment: $350,000. Increment: $175,000, 9/1/06-3/31/07. Increment: $350,000, 8/1/07-6/30/08.

42. MD. Procurement Office, MDA90402C0428, University Partnership with Laboratory for Telecommunications Sciences, J. JaJa (PI), $9,733,341 (May 2002 – May 2007).

43. NASA, Global Land Cover Facility, J. Townshend (PI) and J. JaJa (Co-PI), funded at the level: $400,000 FY04, $450,000 FY05, and $200,000 FY06.

44. NSF, CISE Research Infrastructure Award, A. Varshney (PI) with co-PIs: R. Chellappa, J. JaJa, R. Duraiswami, and D. O'Leary, $1.1M, June 2004 – May 2007.

45. NSF, Crant #IISO455995, Robust Technologies for Automated Ingestion and Long Term Preservation of Digital Data, J. JaJa (PI), A. Druin (co-PI), and D. Oard (co-PI), $490,157, July 05 – July 07.

46. MD. Procurement Office, MDA90402C0428, University Partnership with Laboratory for Telecommunications Sciences, J. JaJa (PI), $984,900 Increment (January 2007- September 2007).

47. Army Research Labs, STTR Phase II, Rapid, Hardware-Accelerated, Large-Data Visualization, A, Varshney (PI) and J. JaJa (co-PI), $250,000, Subcontract to Kitware, DOD STTR Contract: 060107778, Oct 2006 - Sept 2008.

48. MD. Procurement Office, University Partnership with the Laboratory for Telecommunications Sciences, J. JaJa (PI), $2,026,240, August, 2007 – January, 2010.

49. Library of Congress, The Chronopolis NDIIPP Project, J. JaJa (UMD PI), $207,122, February, 2008 – May, 2009. Additional Funding: $74,984 through 9/30/09. Additional Funding: $47,055 through 12/31/09. Additional Funding: $144,799 through 8/31/10.

50. NSF, Petascale Algorithms for Multi-body, Fluid-Structure Interactions in Viscous Incompressible Flows, PI: E. Belaras, Co-PIs: J. JaJa and S.Solares,: $1,049,852, 9/1/2009 – 8/31/2013.

51. MD. Procurement Office, University Partnership with the Laboratory for Telecommunications Sciences, J. JaJa (PI), $4,868,0226, 1/13/2010 – 1/28/2013.

52. U.S. Library of Congress, Efficient, Robust and Cost Effective Tools for Ensuring Content Integrity, Joseph JaJa, PI, $316,065, 9/30/2010 – 09/29/2012.

53. NSF, National Socio-Environmental Synthesis Center, PI: Margaret Palmer, $29,969,984, 8/31/2011 – 8/30/2016.

54. University of California – San Diego, Chronopolis Partnership with the San Diego Supercomputer Center, J. JaJa, PI, $150,000, 1/1/2012 – 6/30/2013.

55. University of California, San Diego, Chronopolis Support for the Digital Preservation Network, J. JaJa, PI, $228,536, 04/01/2013-03/31/2015. Additional Funding: $50K, with an end date of 6/30/2016.

56. NSF, Development of Augmentarium: High Performance Visual Computing Infrastructure and Adaptive Display, PI: A. Varshney, co-PIs: J. JaJa, L. Mundy, C. Plaisant, $600,000, 08/01/2014 – 07/31/2017.

57. NIH-Natl Inst Deafness & Other Communication Disorders, Biosimulation of Vocal fold Surgical Injury, PI: Yee Key Li, 09/15/2012-08/31/2015. Role: Senior Investigator receiving support for one graduate student.

58. University Corporation for Advanced Internet Development, Digital Preservation Network (DPN), J. JaJa, PI, $159,962, 02/01/2015 – 01/01/2017.

59. Parallel Implementation of ABM Models for Vocal Fold Inflammation and Healing, PI: J. JaJa, $189,965, Subcontract from McGill University, 09/01/2015 – 08/31/2018.

60. Computing with Trajectories: Novel methods for understanding spatio-temporal function MRI data, PIs: Luiz Pessoa and Joseph JaJa, FY17 BBI Seed Grant, $53,439 plus fringe and tuition, 05/01/2017 – 04/30/2018.

61. The Chronopolis Partnership between the University of Maryland and the University of California at San Diego, J. JaJa, PI< $484,480, 01/01/2017 – 6/30/2021.

62. NSF - CRI: HoloCamera: An Immersive Gigapixel Cyberinstrument for Creating Precision Virtual Environments, PI: Amitabh Varshney; co-PIs: J. JaJa, S. Bhattacharyya, M. Zwicker and H. Kacorri, $999,885, 9/1/2018 – 8/31/2021, CNS- 18-23321.

63. DoD – Partnership with the Laboratory for Telecommunication Sciences, PI: Joseph JaJa, $924,710, 01/29/2019 – 01/31/2023 plus two optional years.

64. DoD – Maryland Procurement Office/Laboratory for Physical Sciences, PI: Joseph JaJa, $2,454,854, 01/07/2019 – 09/30/2023.

65. NIH R01 MH071589: Interaction of Emotional Perception and Visual Attention, PI: Luiz Pessoa, 7/1/2020 – 06/20/2025 (Role: Contributor at 5% FTE).

66. DoD – Partnership with the Laboratory for Telecommunication Sciences, PI: Joseph JaJa, my share: $426,024 (annually), 02/01/2024-01/31/2025 (expected to continue for five years).

67. FDA/IHC Collaboration supporting two of my graduate students.

Professional Service

- Frontiers on Massively Parallel Computation, Program Committee Chair, 1991
- International Parallel Processing Symposium, Program Committee Member, 1992
- Special Issue of JPDC on Data-Parallel Algorithms and Programming, Guest Editor, 1994
- Progress in Automation and Information Systems, Associate Editor, 1990
- International Parallel Processing Symposium, Program Committee Member, 1994
- Journal of Parallel and Distributed Computing, Subject Area Editor on Parallel Algorithms, 1993-
- Frontiers on Massively Parallel Computation, Program Committee Member, 1995
- International Parallel Processing Symposium, Program Committee Chair, 1995
- IEEE Transactions on Parallel and Distributed Systems, Associate Editor, 1995- 1997
- International Conference on High Performance Computing, Program Committee Member, 1995
- International Conference on Image Processing, Program Committee Member, 1995
- International Parallel Processing Symposium, Program Committee Member, 1996, 1997
- Workshop on Parallel Algorithms, Program Chair, 1996
- International Conference on Parallel Processing, Program Committee Member, 1996
- Parallel DSP and Image Processing, Euro-Par '96 Workshop, co-chair of Program Committee, 1996
- IEEE Symposium on Parallel and Distributed Processing, Program Committee Member, 1996
- Frontiers '96, Program Committee Member
- IEEE Computer Society Fellow Evaluation Committee, 1996
- Symposium on Parallel Algorithms and Architecture, Program Committee Member, 1998

- International Conference on Parallel and Distributed Computing and Systems, Member of the Steering Committee, 1997-
- International Conference on Parallel Processing, Program Committee Vice-Chair for Algorithms and Applications, 1998
- International Conference on Parallel Processing, Program Committee Vice-Chair for Algorithms and Applications, 1998
- IASTED International Conference on Parallel and Distributed Computing and Networks, Program Committee Member, 1998
- International Conference on High Performance Computing, Program Committee Member, 1998
- International Conference on Parallel and Distributed Computing Systems (PDCS), Member of the Steering Committee, 1998-1999
- International Parallel and Distributed Processing Symposium, Co-General Chair, 2000-2001
- Workshop on Advances in Parallel and Distributed Computational Models, Member of Steering Committee, April 2002 – 2004.
- IASTED International Symposium on Parallel and Distributed Computing and Networks, Member of Program Committee, 2002.
- Workshop in High Performance Computational Biology, Member of Program Committee, Fort Lauderdale, Florida, April 2002.
- Workshop in High Performance Computational Biology, Member of Program Committee, Nice, France, April 2003.
- IASTED Conference on Parallel and Distributed Computing and Systems, Member of Advisory Committee and Program Committee, 2002 - 2003.
- International Journal of Foundations of Computer Science, Member of the Editorial Board, 2002-present.
- International Conference on Parallel and Distributed Computing Systems, Member of the Program Committee, 2004.
- Workshop on Advances in Parallel and Distributed Computational Models (APDCM 2004), Member of the Steering Committee, 2004.
- Second Symposium on Intelligence and Security Informatics (ISI-2004), Member of the Program Committee, 2004.
- IASTED International Conference on Advances in Computer Science and Technology (ACST-2004), Member of the Program Committee, Nov. 2004.
- International Workshop on High Performance Computational Biology, Member of the Program Committee, 2003-2004.
- Workshop on Advances in Parallel and Distributed Computational Models, Member of the Steering Program Committee, 2004-2005.
- Workshop on Advances in Parallel and Distributed Computational Models (APDCM), Member of the Program Committee, 2005-2006.
- NSF Workshop on the Storage Resource Broker, General Chair with Arcot Rajasekar, Dec. 8-9, 2005, San Diego, California.
- Member of the Advisory Committee for the International Symposium on Parallel Architectures, Algorithms and Networks, 2008.
- Member of the Steering Committee for the Workshop on Advances in Parallel and Distributed Computational Models, 2008-2013.
- Member of the South Big Data Innovation Hub Executive Committee, 2015 – present
- Member of Program Committee, Machine Learning at a Scale Workshop, in conjunction with Supercomputing 2016 and 2017.