

PADMA RAGHAVAN
Vanderbilt University
Vice Provost for Research
Professor, Computer Science & Computer Engineering

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Education

12/91 Ph.D. Computer Science, Penn State (The Pennsylvania State University), University Park, PA

8/87 M.S. Computer Science, Penn State, University Park, PA

7/85 B.Tech. (Honors), Computer Science and Engineering, Indian Institute of Technology, Kharagpur, India

Employment

2/16 – present Inaugural Vice Provost for Research, Vanderbilt University

2/16 – present Professor of Computer Science and Computer Engineering, Vanderbilt University

10/13 – 1/16 Associate Vice President for Research, Penn State

7/10 – 1/16 Founding Director, Institute for Computational & Data Science, Penn State

3/12 – 1/16 Distinguished Professor, Department of Computer Science and Engineering, Penn State

7/05 – 3/12 Professor, Department of Computer Science and Engineering, Penn State

8/00 – 7/05 Associate Professor, Department of Computer Science and Engineering; Penn State

8/94 – 7/00 Assistant Professor, Department of Computer Science, the University of Tennessee

3/99 – 7/04 Consultant, Sandia National Laboratory

8/95 – 7/00 Research Scientist, Oak Ridge National Laboratory

8/91 – 7/94 Post-Doctoral Research Associate, National Center for Supercomputing Applications, University of Illinois

Research

Research contributions are in the form of new algorithms in two broad areas:

- Computational and data science including parallel matrix and graph algorithms for predictive modeling, e.g., structural mechanics, material science, neuroscience.
- High performance computing aka supercomputing, including scalable, energy-efficient, and resilient algorithms.

Summary counts include 6 edited volumes/book chapters/position papers; 118 refereed publications; 44 M.S. and Ph.D. theses and 7 post-doctoral researchers supervised; and 35 grants awarded totaling approximately \$20 million from various agencies including Army, DARPA, DOE, NASA, NSA, NSF, and NIH, as well as corporate sponsors including IBM.

See a full list of publications, grants, and student supervision [here](#).

Honors and Awards

- Fellow of the IEEE, for contributions to robust scalable sparse solvers and energy-efficient parallel scientific computing, 2013.
- The Maria Goeppert-Mayer Distinguished Scholar Award, Argonne National Laboratory (Department of Energy) and the University of Chicago, for contributions to scalable parallel techniques for sparse

linear system solution, 2002.

- The National Science Foundation, Computer and Information Science and Engineering Directorate, CAREER Award for parallel sparse matrix computations, 1995-2000.
- Awards for Refereed Publications (* indicates student or postdoctoral fellow supervision):
 - A. Benoit, V. Le Fèvre*, P. Raghavan, Y. Robert, H. Sun*. 2020. Design and Comparison of Resilient Scheduling Heuristics for Parallel Jobs. In *Proceedings of the 22nd Workshop on Advances in Parallel and Distributed Computational Models (APDCM '20)*, 2020. New Orleans, LA, USA. (Best Paper)
 - S. Kirmani*, P. Raghavan. 2013. Scalable Parallel Graph Partitioning. In *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC '13)*, November 2013, Denver, CO, USA, 51:1-10. (Finalist for Best Student Paper Award)
 - M. Shantharam*, S. Srinivasmurthy*, P. Raghavan. 2011. Characterizing the Impact of Soft Errors on Iterative Methods in Scientific Computing. *ACM International Conference on Supercomputing* (2011), 152-161. (Invited Paper, Short version awarded Best Poster at Supercomputing 2010)
 - Y. Ding*, M. Kandemir, P. Raghavan and M. J. Irwin. 2008. A Helper Thread Based EDP Reduction Scheme for Adapting Application Execution in CMPs. *22nd IEEE/ACM International Parallel and Distributed Symposium (IPDPS '08)*, 2008, 1-14. DOI: 10.1109/IPDPS.2008.4536297. (Best Paper)
- The Pennsylvania State University
 - Faculty Scholar Medal for contributions to parallel scientific computing, 2010.
 - Committee on Institutional Cooperation Academic Leadership Program Fellow, 2009.
 - Faculty Teaching Award, Department of Computer Science and Engineering, 2006.

Selected Advisory and Review Board Activities (Most recent 10 years)

- National Science Foundation
 - Directorate for Computer and Information Science and Engineering, Advisory Committee (CISE-AC), 2015-2023. <https://www.nsf.gov/cise/advisory.jsp>
 - Office of International Science and Engineering, Advisory Committee (AC-ISE), 2020-2023. <https://www.nsf.gov/od/oise/OISE-AC/Bios/index.jsp>
 - Office of Cyberinfrastructure, Advisory Committee (AC-CI), 2018-2021. <https://www.nsf.gov/cise/oac/advisory.jsp>
 - Search Advisory Committee for the Assistant Director, Directorate for Computer and Information Science and Engineering (CISE), 2019. <https://www.nsf.gov/cise/advisory.jsp>
 - Notable Review Panels:
 - Expeditions in Computing, Blue Ribbon Reverse Site Visit (panelist), 2015.
 - XSEDE: Extreme Science and Engineering Discovery Environment (chair), 2014.
 - Committee of Visitors for the Review of the Office of Cyberinfrastructure, 2005-2010, 29-page report, 2011. <https://www.nsf.gov/od/oia/activities/cov/oci/2011/OCI%20COV%20FY%202008%20-%20FY%202010%20-120512.pdf>
 - Network for Earthquake Engineering Simulation Governance Board, 2011-2015. https://www.nsf.gov/news/special_reports/nees/NetworkforEarthquakeEngineeringSimulation_SR.pdf

- National Academies Panels and Committees
 - National Academy of Sciences Journal Summit, Senior Research Officers Panel, March 22-23, 2021.
 - National Research Council (NRC) Committee on Future Directions for NSF Advanced Computing Infrastructure to Support U.S. Science in 2017-2020, 2014-2016. <https://www.nap.edu/catalog/21886/future-directions-for-nsf-advanced-computing-infrastructure-to-support-us-science-and-engineering-in-2017-2020>
 - Laboratory Assessments Board, Review of the Information Technology Laboratory at the National Institute of Standards and Technology (NIST), 2018. <https://www.nap.edu/initiative/panel-on-review-of-the-information-technology-laboratory-at-the-national-institute-of-standards-and-technology>
 - Division of Engineering and Physical Sciences: Technical Advisory Board to assess the scientific quality of R&D at the Army Research Laboratory.
 - Information Sciences, 2019. <https://www8.nationalacademies.org/pa/projectview.aspx?key=49528>
 - Computational Science, 2017-2018. <https://www.nap.edu/read/25011/chapter/1>
 - Information Sciences, 2013-2016. <https://www.nap.edu/read/21916/chapter/1>
 - Digitization and Communications Science, 2009-2012. <https://www.nap.edu/read/18269/chapter/1>
- Department of Energy and its Laboratories
 - Member, Board of Governors, UT-Battelle, manages Oak Ridge National Laboratory for the Department of Energy, 2016-present.
 - Lawrence Livermore National Laboratory (LLNL), Computation Directorate External Review Committee, 2009-2012, 2014-2015.
 - Office of Science, Committee of Visitors for the Applied Mathematics Advanced Scientific Computing Research (ASCR) program, 2013.
- Computer Research Association
 - Committee on the Status of Women in Computing Research (CRA-W) Board of Trustees, co-chair for the Distinguished Lecture Series, 2013-2016. <http://cra-w.org/Home.aspx> .
 - Faculty Career Development Workshops, speaker 2010-2016.
 - Graduate Cohort Workshops, speaker 2009-2015.
- U.S. Army Research Office, Board of Visitors, Computing Sciences Division 2014.
- China-US Software Workshop, National Science Foundation and the National Natural Science Foundation of China, Leader, Extreme-Scale Software, 2012.
- Blue Waters Petascale Applications Advisory Committee, NCSA and The University of Illinois at Urbana-Champaign, 2009-2011.
- The National Science Foundation and WTEC Co., Inventing a New America through Discovery and Innovation in Science, Engineering and Medicine. Chapter 6 – “Ensuring Sustainable Software for Simulation-Based Engineering and Science”, 2010. http://www.nsf.gov/mps/ResearchDirectionsWorkshop2010/RWD-color-FINAL-usletter_2010-07-16.pdf
- National Science Foundation and WTEC Co., Committee on Vision for Simulation Based Engineering and Science Research in the Next Decade, Software Section, 2009. <http://www.wtec.org/sbes-vision/>

Selected Professional Activities and Editorships (Most recent 10 years)

- Association of America Universities, Senior Research Officers Annual Meeting Planning Committee 2019-2020; Steering Committee, 2021.
- American Association for the Advancement of Science, [Golder Goose Award](#) committee member, 2017-2019, 2021.
- Board of Visitors, Oden Institute for Computational Engineering and Sciences, The University of Texas at Austin, 2021.
- EU Visual Exploration for Extreme Computing Project, Advisory Board, Project Director Andreas Gerndt, German Aerospace Center (DLR), 2019-present.
- The Society for Industrial and Applied Mathematics (SIAM)
 - Member of the Council, SIAM is led by its officers, elected members of its Board and Council, 2015 -2020. <https://www.siam.org/About-SIAM/Leadership>
 - Committee on Science Policy, 2015-2019. <https://www.siam.org/About-SIAM/Committees/Committee-on-Science-Policy-CSP>
 - Wilkinson Prize Selection Committee, 2018.
 - Book Committee, 2017-present. <https://www.siam.org/about-SIAM/committees/Book-Committee>
 - Editorial Board, SIAM series on Computational Science and Engineering, 2009-2016. <http://bookstore.siam.org/computational-science-and-engineering/>
 - SIAM Workshop on Future Directions in Computational Science and Engineering Education and Research, 2015.
 - Editorial Board, SIAM series on Software, Environments and Tools, 2012 – present. <http://bookstore.siam.org/software-environments-and-tools/>
 - Associate Editor, SIAM Journal of Scientific Computing, 2005-2012. <https://www.siam.org/Publications/Journals/SIAM-Journal-on-Scientific-Computing-SISC>
 - Co-Chair, SIAM Conference on Computational Science and Engineering, January 2010 - March 2011 (850 attendees). <https://archive.siam.org/meetings/cse11/index.php>
- The Institute of Electrical and Electronic Engineers (IEEE) and the Association of Computing Machinery (ACM)
 - Chair, Technical Program, IEEE/ACM Supercomputing 2017, November 2015 – November 2017 (over 10,000 attendees).
 - IEEE Young Achievers in Scalable Computing Selection Committee, 2014-2016.
 - Co-Chair, Awards, IEEE/ACM Supercomputing 2015.
 - IEEE Computer Society Fellows Evaluation Committee, 2015.
 - Co-Chair, Invited and Plenary Talks, IEEE/ACM Supercomputing 2014.
 - Vice-Chair, Applications, IEEE International Parallel and Distributed Processing Symposium (IPDPS) 2014.
 - Ad hoc committee to establish a "Verified Results" policy for the ACM Transactions on Mathematical Software, member, 2012.
 - Co-Chair Technical Papers, Supercomputing 2012 (over 9,000 attendees).
 - Chair, Doctoral Research Showcase, IEEE/ACM Supercomputing, 2009.
- Associate Editor, Journal of Computational Science, 2011-2015. <http://www.journals.elsevier.com/journal-of-computational-science/>
- Associate Editor, Journal of Parallel and Distributed Computing, 2010-2015 <http://www.journals.elsevier.com/journal-of-parallel-and-distributed-computing/>

Selected Invited Presentations (Most recent 10 years)

- 11/18 IEEE/ACM Supercomputing, SC'18, Dallas, TX, USA, *Superscaling Performance through Energy-Efficient Supercomputing*.
- 7/18 Workshop on Clusters, Clouds and Data for Scientific Computing, Chemin de Chanze, France, *Rethinking the Computational Complexity and Efficiency in the Age of 'Big Data.'*
- 4/18 Purdue University, West Lafayette, IN, USA, *Rethinking Performance and Resiliency for Massively Parallel Processing of Large Sparse Data Sets*.
- 9/16 The 28th International Workshop on Languages and Compilers for Parallel Computing, Raleigh, NC, USA, Keynote, *Toward programming models for parallel processing of sparse data sets*.
- 7/15 Algorithms and Scheduling Techniques to Manage Resilience and Power Consumption in Distributed Systems, Schloss Dagstuhl, Germany, *Scheduling for parallel sparse matrix computations*.
- 3/15 SIAM Conference on Computational Science and Engineering (SIAM CSE15), Salt Lake City, UT, USA, Panel Speaker, *The Future of CSE as a Discipline*.
- 9/14 Clusters and Computational Data for Scientific Computing Workshop, Lyon, France, *Sparse computations and soft errors*.
- 7/14 9th Scheduling for Large Scale Systems Workshop, Lyon, France, *Energy-aware high throughput co-schedules*.
- 11/13 EarthCube End-User Domain Workshop for Rock Deformation and Mineral Physics Research 2013, Alexandria, VA, USA, *Cyberscience: driving innovations through computational and data-enabled research*.
- 8/13 National Science Foundation Division of Advanced Cyberinfrastructure, Washington, D.C., USA, *Science in the Digital Age: Experiences & Perspectives*.
- 9/12 Clusters, Clouds & Data for Scientific Computing CCDSC 2012, Dareizé, France, *Strong Scaling for Sparse Codes: Myth or Reality?*
- 6/12 7th International Workshop on Parallel Matrix Algorithms and Applications (PMAA'12), Birkbeck University of London, UK, *Achieving energy-aware high performance for parallel sparse matrix and graph computations*.
- 9/11 China-USA Computer Software Workshop, sponsored by the National Natural Science Foundation of China (NSFC) and the US National Science Foundation (NSF), Peking University, Beijing, China, *Extreme-Scale Software*.
- 5/11 Advanced Computing and Computational Sciences Division, Army Research Laboratory, Aberdeen, MD, USA, *New Dimensions to Parallel Computing: Co-managing Performance, Reliability, Energy Trade-offs*.
- 4/10 Computer Science, Cornell University, Ithaca, NY, USA, *Energy-Aware Scalability of Parallel Sparse Scientific Computing*.