

Jeffrey S. Vitter

Curriculum Vitæ

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1. Personal

Chancellor
Distinguished Professor of Computer & Information Science
The University of Mississippi
123 Lyceum
Box 1848
University, MS 38677-1848 USA

Web: chancellor.OleMiss.edu
Email: chancellor@OleMiss.edu, Twitter: @UMchancellor
Tel.: +1 (662) 915-7111
FAX: +1 (662) 915-5935
Chief of Staff: Ms. Sue Keiser, stkeiser@OleMiss.edu

Born in New Orleans, Louisiana.
Married, two daughters and one son.



2. Biography

Jeff Vitter is the 17th chancellor of the University of Mississippi and Distinguished Professor of Computer & Information Science. Known affectionately as Ole Miss, UM was founded in 1848 and is the flagship and largest university in the state of Mississippi, with about 2,200 faculty members, 10,600 staff, 24,250 students, and an annual budget of \$2.1 billion. It is ranked by the Carnegie Foundation in the category R1: highest research activity — representing the top 2.5% of colleges and universities nationally. UM is a comprehensive institution of 17 colleges and schools, spanning the main campus in Oxford, the University of Mississippi Medical Center in Jackson, and satellite campuses in Booneville, Grenada, Tupelo, and Southaven.

The University of Mississippi Medical Center is the state of Mississippi's only academic medical center. Besides academic units, UMMC also houses the University Hospitals and Health System and the University Physicians medical practice plan, with the state's only Level 1 trauma hospital and Children's Hospital. UMMC includes the teaching hospitals for the medical educational programs and serves as a diagnostic and treatment referral center for the entire state. Each year UMMC has over 1 million patient visits.

UM is a sea-grant and space-grant institution. It houses the field station in Abbeville, the Sally M. Barksdale Honors College, the Center for Intelligence and Security Studies, the Chinese Language Flagship Program, the Croft Institute for International Studies, the Institute of Child Nutrition, the National Center for Natural Products Research, and the National Center for Physical Acoustics.

Fueled by his belief in the power of higher education to transform lives, communities, and the world, Dr. Vitter has charted the university's momentum to achieve ever greater heights. Ole Miss is continuing its long legacy of leadership in academic excellence with a \$1 billion building program including a state-of-the-art STEM building, creation of superlative networks of faculty called Flagship Constellations, major community partnerships, and greater capacity and reach of the UM Medical Center.

In addition, Dr. Vitter relishes his role as the voice of the university. Since arriving at Ole Miss, he has greatly expanded communication and connectivity via town halls, informational blogs, and robust use of social media. He and his wife Sharon are often seen around campus, in the Grove, at athletic events, and on restaurant stools throughout Mississippi, getting to know people the old fashioned way.

From 2010–2015, Dr. Vitter was the provost, executive vice chancellor, and Roy A. Roberts Distinguished Professor at the University of Kansas, an AAU institution comprising about 2,800 faculty members, 7,200 staff, 28,100 students, and an annual budget of \$1.2 billion, serving the main campus in Lawrence (with 10 colleges and schools), the Edwards campus in Overland Park, and the Medical Center campuses in Kansas City, Wichita, and Salina. As provost, Dr. Vitter was the chief academic and operations officer for the

Lawrence and Edwards campuses. He initiated and co-led the campus-wide development of KU's strategic plan, *Bold Aspirations*, www.provost.ku.edu/planning. The plan is KU's transformative roadmap as a top-tier public international research university. Dr. Vitter's accomplishments include the first-ever university-wide KU Core curriculum; major facilities construction; expansion of the Schools of Engineering, Business, and Pharmacy; boosting multidisciplinary research and funding around four strategic initiatives; alumni outreach and furthering the goals of the capital campaign; major growth of technology commercialization and corporate partnerships; incentivizing innovation; and administrative reorganization and efficiency.

Previously Dr. Vitter was on the faculty in the Department of Computer Science and Engineering at Texas A&M University. From 2008–2009, he served at Texas A&M as provost and executive vice president for academics, where he had the responsibility of chief academic officer for an AAU university of roughly 2,700 faculty members, 5,500 staff, 48,000 students, and an annual budget of \$1.2 billion, comprising 10 colleges and schools. Besides the main campus in College Station, Texas, he oversaw the campuses in Galveston, Texas and Doha, Qatar. Dr. Vitter led the collaborative launch of a number of important recruiting efforts and far-reaching faculty initiatives, involving faculty start-up allocations, multidisciplinary priorities, balanced scorecard reviews and recognition, and diversity. Most significantly, he led the campus-wide development of the university's Academic Master Plan.

From 2002–2008, Dr. Vitter served as the Frederick L. Hovde Dean of the College of Science and Professor of Computer Science at Purdue University, an AAU institution. As dean, he was the chief academic officer of the College of Science. The college comprised seven departments, 325 faculty, 550 staff, 1,000 graduate students, and 2,800 undergraduate majors, with an annual budget of \$130 million. Several programs were nationally ranked. College courses accounted for about a quarter of the university's 1 million student credit hours. Dr. Vitter led the collaborative development of two college strategic plans — emphasizing both core excellence and multidisciplinary — and led the college's fundraising efforts in the capital campaign. The college grew by two major new buildings and 61 faculty members, several hired under the innovative COALESCE faculty program targeting global priorities. He launched a comprehensive study of the undergraduate program; the resulting new curriculum was the college's first significant curricular change in 40 years. He developed the L.E.A.D. peer mentoring diversity initiative that was adopted university-wide, and with help from his Dean's Leadership Council he initiated the Science Business Partners Program, Science Journalism Laureates program, and innovative hiring processes.

From 1993–2002, Dr. Vitter held a distinguished professorship at Duke University, an AAU institution, where he was the Gilbert, Louis, and Edward Lehrman Professor. He served at Duke as chair of the Department of Computer Science in the College of Arts and Sciences from 1993–2001 and as co-director and a founding member of Duke's Center for Geometric and Biological Computing from 1995–2002. As chair, he led the department to significant improvements in stature — characterized by a top-20 ranking, stellar faculty hires, dynamic strategic plans, culture of inclusiveness, curriculum redesign, administrative reorganization, substantial growth in both undergraduate and graduate programs, creation of a successful industry partners program, and rise in sponsored research expenditures to 250%.

From 1980–1992, Dr. Vitter rose through the faculty ranks and in leadership roles in the Department of Computer Science at Brown University, an AAU institution. He earned tenure in 1985 at the age of 29.

Dr. Vitter serves in advisory roles for the Association of Public and Land-grant Universities (APLU); previously he chaired the executive committee of its Council on Academic Affairs. He has served on the Advisory Committee of the National Science Foundation (NSF) Directorate for Computer & Information Science & Engineering, and on committees for the Association of American Universities (AAU). He was on the Board of Directors of the Computing Research Association and co-chaired its Government Affairs Committee. He is an emeritus member of the Board of Advisors of the School of Science and Engineering at Tulane University. He chaired ACM SIGACT, the Special Interest Group on Algorithms and Computation Theory of the world's largest computer professional organization, the Association for Computing Machinery. He served on the executive council of the European Association for Theoretical Computer Science. Sabbatical sites include the Mathematical Sciences Research Institute in Berkeley; INRIA in Rocquencourt, France; Ecole Normale Supérieure in Paris; Bell Laboratories in Murray Hill; and INRIA in Sophia Antipolis, France.

Dr. Vitter has been named a Guggenheim Foundation Fellow, a Fellow of the American Association for the Advancement of Science (AAAS), a Fellow of the Association for Computing Machinery (ACM), a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), a National Science Foundation Presidential Young Investigator, a Fulbright Scholar, and an IBM Faculty Development Awardee. He has well over 300 book, journal, conference, and patent publications and has given over 200 invited professional presentations worldwide. His Google Scholar h-index is in the upper 60s, and he is an ISI highly cited researcher.

His book *Algorithms and Data Structures for External Memory* (Now Publishers, 2008) covers the field that he helped found. He coauthored the books *Efficient Algorithms for MPEG Video Compression* (Wiley & Sons, 2002) and *Design and Analysis of Coalesced Hashing* (Oxford University Press, 1987). He co-edited *External Memory Algorithms*, *Algorithm Engineering*, and *Academic Leadership in Higher Education: From the Top-down and the Bottom-up*. His editorial board memberships have included *Algorithmica*, *Communications of the ACM*, *IEEE Transactions on Computers*, *PeerJ Computer Science*, *Theory of Computing Systems*, and *SIAM Journal on Computing*. He edited several special issues and serves on the steering committee of *IEEE/ACM Transactions on Computational Biology and Bioinformatics* and advisory board of *PeerJ Computer Science*. He has consulted widely and co-holds patents in the areas of external sorting, parallel I/O, prediction, and approximate data structures. He proposed the concept and helped design what became the Purdue University Research Expertise database (PURE) and the Indiana Database for University Research Expertise (INDURE), www.indure.org.

His educational degrees include a B.S. with highest honors in mathematics in 1977 from the University of Notre Dame; a Ph.D. in computer science under Donald Knuth in 1980 from Stanford University; and an M.B.A. in 2002 from the Fuqua School of Business at Duke University. He was born and raised in New Orleans, Louisiana (as everyone who knows him knows!).

Dr. Vitter's wife Sharon is a native Kansan and pharmacy alumna of KU. Their three children Jillian, Scott, and Audrey were born in Providence, RI and are Notre Dame alumni. Jillian received her medical degree from Georgetown University and is a practicing anesthesiologist. Scott, a former U.S. Army Ranger, is a PhD student in mechanical engineering at the University of Texas at Austin. Audrey is on the G.E. Corporate Audit Staff in Zurich, Switzerland. The Vitters are passionate about the arts and genealogy and are huge sports fans.

3. Research Interests

In his research, Jeff Vitter exploits the rich interdependence between computing theory and practice. Beginning with his thesis on coalesced hashing, a widely used search method, Dr. Vitter has made many contributions to the design and analysis of algorithms, using mathematical analysis and asymptotics to derive precise estimates for resource requirements.

Dr. Vitter works primarily in four key subfields dealing with big data. He is perhaps best known as a founder of the field of external memory algorithms, which focuses upon alleviating the I/O communication bottleneck between fast internal memory and slow external storage (such as disk), which is important for a variety of data-intensive applications. His 2008 book, *Algorithms and Data Structures for External Memory*, is a reference for the field. His approach for utilizing parallel independent disks, using the notion of read/write duality, has led to state-of-the-art sorting methods. He has contributed to algorithm engineering via the TPIE system (Transparent Parallel I/O programming Environment) developed by a former student.

A second area of big data is compressed data structures. The goal is to operate directly upon compressed representations of data and still achieve fast response time. Dr. Vitter co-developed the wavelet tree data structure (not to confuse with wavelets discussed two paragraphs below), which is an elegant structure for coding sequences from a multicharacter alphabet; it is a key component in modern indexing and compression. Until this century, fast data structures for text indexing (such as suffix trees and suffix arrays) required much more space than the data being indexed! Based upon a recursive decomposition of the suffix array, Dr. Vitter and colleagues invented the compressed suffix array — the first fast index provably shown to require only linear space, and then later the first ever whose size per character was proven to be asymptotic (i.e., with constant of proportionality 1) to the higher-order entropy of the text. The index can reconstruct the original text in a random access manner, and thus the original text can be discarded. The net effect is that the text can be completely replaced by an index structure that is fast to query and has small size.

In a third aspect of big data, Dr. Vitter has done fundamental work on data compression for text, images, and video. He is noted for his analytical bent. A provably efficient algorithm for adaptive Huffman coding bears his name. With a former student, Dr. Vitter developed and analyzed practical methods for arithmetic coding. They invented the FELICS algorithm for lossless image compression, later implemented in hardware as part of NASA's Mars Reconnaissance Orbiter. It introduced a low-cost prediction framework that influenced algorithms adopted into the Lossless JPEG standard. In video compression, Dr. Vitter and group proposed the paradigm of minimizing the combined measure of rate plus distortion to significantly improve motion estimation coding; rate-distortion optimization has since been incorporated into the H.264/MPEG-4 AVC standard's reference encoder, used widely in the computing and communications industry.

Fourth, Dr. Vitter and collaborators were the first in the database and systems communities to apply wavelets and compression techniques as key tools for summarizing, approximating, and predicting data. Wavelets have since become widely used in database optimization, data warehousing, data streams, image processing, and data mining. For his work on wavelets, he and coauthor received the 2009 ACM SIGMOD Test of Time award, which recognizes the SIGMOD paper from 10 years earlier that had the most subsequent impact in research, products, and methodology. Dr. Vitter co-developed novel machine learning and prediction mechanisms based upon data compression, using the principle that the more compressible a sequence is, the more predictable it is. His universal prediction algorithms for online prefetching are provably asymptotically optimal (i.e., with constant of proportionality 1). They predict as well as special-purpose methods tuned to the characteristics of the sequence. His learning work includes algorithms for prefetching, caching, data streams, database query optimization, data mining, and power management in mobile devices.

4. Education

B.S. (with highest honors), mathematics, University of Notre Dame, 1977.

Ph.D., computer science, Stanford University, 1980.

Dissertation topic: *Analysis of Coalesced Hashing* (supervised by Donald E. Knuth).

M.B.A., Duke University, 2002.

5. Appointments and Administrative Accomplishments

At the University of Mississippi

2016–present Chancellor and Distinguished Professor of Computer & Information Science.

Major administrative accomplishments at Ole Miss:

- Leadership of the University of Mississippi as a comprehensive public international research university — Mississippi’s flagship and Carnegie R1 research university.
- Launched Flagship Forum, a 100-day listening and learning tour visiting over 200 groups, to dialog with the entire Ole Miss family about strategic directions.
- Facilitated strong, trusted relationships among all components of the university and the Board of Trustees of the State Institutions of Higher Learning.
- Initiated university-wide strategic planning initiatives, including formation of multidisciplinary research clusters called Flagship Constellations and scholarly engagement with local communities.
- Initiated several new communication mechanisms and expanded transparency across campuses and alumni, making use of town halls, blogs, letters, and social media.
- Reorganized university advancement, led major fundraising, and restructured communications, government relations, and events into university relations.
- Hired university’s first vice chancellor for diversity and community engagement.
- Launched updated campus master plan and introduced a strategic process for capital planning.
- Close involvement with legislative matters and in numerous university and statewide organizations.

At the University of Kansas

2010–2015 Provost and executive vice chancellor (chief academic officer and chief operations officer for the Lawrence and Edwards campuses).

2011–2015 Roy A. Roberts Distinguished Professor.

2010 Professor, Department of Electrical Engineering and Computer Science.

Major administrative accomplishments at KU:

- Collaboration with KU community, medical center, and external partners on KU's mission and vision.
- Oversight of broad community development and phased implementation of KU's transformative strategic plan *Bold Aspirations*, www.provost.ku.edu/planning. Data-driven goals and metrics.
- Creation of KU's first-ever university-wide undergraduate curriculum, the KU Core, kucore.ku.edu.
- Highly productive and collaborative team of vice provosts and deans. Regular leadership meetings and retreats, emphasizing innovation, synergies, data-driven methodology, and all-funds budgeting.
- Served as vice chair of board of Kansas Athletics, Inc. and on its Finance and Audit Committee.
- Served as chair of board of KU Innovation and Commercialization, kuic.ku.edu, KU's highly functioning technology commercialization arm. Most incubator space in region. Substantial growth in licensing, startups, corporate partnerships and philanthropy, and collaborations with KU Medical Center.
- 10-year Higher Learning Commission reaccreditation planning, successful visit, and affirmative report.
- Restructure of student affairs, academic affairs, study abroad, and enrollment management. Revamped recruiting practices to grow enrollment. Four-year scholarships. Regents approval of new admission standards. Growth in engineering, business, pharmacy, online programs, and international students.
- Significant new efforts in First-Year Experience (firstyear.ku.edu), course redesign, advising, and use of data analytics to improve retention and graduation rate.
- Initiated discussion of Regents systemwide reverse transfer policy, now in place.
- 3× doctoral fellowship funding. Recruitment best practices. Transparent graduate program profiles.
- State funding for 12 distinguished (foundation) professorships and expansion of engineering. Work closely with Board of Regents, Governor's Office, state legislators, and business leaders.
- Four campus-wide multidisciplinary strategic initiatives in research, developed through grass roots proposals. Stellar faculty hired in the strategic initiatives via cluster faculty hires and foundation professorships. Vigorous seed funding to build program success and sustainability.
- Significant rankings improvements in external research funding, engineering, business, and law.
- Worked closely with senate governance (university, faculty, staff, and student) and advisory groups. Annual visits to faculty/staff meetings in nearly every unit. Biweekly newsletters. Highly visible in community and at campus academic and athletics events.
- Development and campus-wide deployment of Hiring for Excellence program, which helps identify and recruit the very best faculty and staff and simultaneously leads to significant growth in diversity.
- Elevation of chief diversity officer position and coordination of student organizations with faculty and staff diversity efforts. Comprehensive campus climate study and task force on sexual assault underway.
- Initiation of rigorous capital planning process. Oversaw Campus Master Plan based upon *Bold Aspirations*. In 2015 over \$350 million of construction underway, including Innovation Way.
- Personal fundraising focus and mentoring of deans in support of *Far Above* capital campaign.
- Changing for Excellence program to restructure and improve administrative services in 11 areas and identify savings that can be invested in *Bold Aspirations* and Campus Master Plan.

At Texas A&M University

2008–2010 Professor, Department of Computer Science and Engineering.

2008–2009 Provost and executive vice president for academics (chief academic officer with oversight for the College Station, Galveston, and Qatar campuses).

Major administrative accomplishments at TAMU:

- Collaboration with the TAMU community and external partners on TAMU mission and vision.

- Inclusive campus development of Academic Master Plan as TAMU's roadmap for excellence in education, research, and engagement. Development of multidisciplinary priority areas.
- Oversight of TAMU engineering educational and research programs in Education City, Qatar. TAMU regarded by the Qatar Foundation as its model partner. Most successful program in the Gulf region.
- Planning for an advanced institute to host and recruit eminent world-class faculty.
- Linked academic priorities with space allocations in the newly constructed and planned buildings.
- Metrics-based budget model to incentivize and recognize growth and excellence.
- Oversight of eight major leadership searches, resulting in six diverse hires: the first Hispanic dean of architecture, the first Hispanic dean of faculties, the first African American vice president of global initiatives, the first African American female vice president for diversity, the first female dean of veterinary medicine, and the first female dean of geosciences.
- Worked with student advisory group on setting tuition and supported policies helping needy students.

At Purdue University

2002–2008 Frederick L. Hovde Dean of the College of Science and Professor of Computer Science.

Major administrative accomplishments at Purdue:

- Restructured dean's office to focus upon functional responsibilities. Formed dynamic leadership team.
- Primary responsibility for fundraising for the College of Science. Surpassed initial college campaign goal of \$91.5 million and realized \$100 million. During my tenure as dean, over \$82 million raised.
- Completed campaigns for \$22 million Lawson Computer Science Building and \$33 million Hockmeyer Hall of Structural Biology, roughly half from philanthropy, plus numerous professorships.
- New outcomes-based undergraduate curriculum — first major change in college in 40 years. Successful launch led to university interest (and eventual development) of first-ever university curriculum.
- School-wide development of seven COALESCE multidisciplinary research areas. Developed and realized college plan to grow faculty size by 61 via multidisciplinary hires. Joint hires made with virtually every other college at Purdue. Significant growth in research funding.
- Partnered in Discovery Park, Purdue's innovative set of multidisciplinary research centers. Co-led efforts to synergize computing interests across campus to create the Cyber Center in Discovery Park.
- Served as chair and/or committee member for university leadership searches, enterprise resource planning, research centers, and external partnerships.
- Reformulated Dean's Leadership Council (DLC) with influential business, government, and academic leaders to provide me with valuable advice and take on crucial projects.
- With DLC chair, developed precursor of KU's Hiring for Excellence program for stellar faculty hires. Proportion hired who were women or minorities was double that of the overall faculty makeup.
- Science Business Partners Program, designed with extensive input of DLC and a dozen CEOs.
- Science Journalism Laureates program to recognize science excellence in media, designed with DLC.
- With DLC member (Blue Cross and Blue Shield CEO), co-planned a healthcare summit for 24 CEO-stature business and medical thought leaders. Led to innovative healthcare projects and programs.
- Proposed and helped design the Purdue University Research Expertise database (PURE), which grew into the Indiana Database for University Research Expertise (INDURE), www.indure.org.
- Initiated L.E.A.D. diversity peer mentoring program to promote diversity awareness among first-year students. Success in College of Science led to university-wide adoption.

At Duke University

- 1993–2002 Gilbert, Louis, and Edward Lehrman Professor (distinguished professorship).
- 1995–2002 Founding member and co-director of Center for Geometric and Biological Computing (originally Center for Geometric Computing).
- 1993–2001 Chair, Department of Computer Science.
- 1993 Professor, Department of Computer Science.

Major administrative accomplishments at Duke:

- Led major culture change to one of inclusiveness, vision, and collaboration among all faculty and staff in department, especially empowering junior faculty to play leadership roles.
- Helped foster a dynamic and inclusive strategic plan that guided faculty hires and investment decisions, transformed department into cutting edge areas, ultimately leading to top-20 rankings.
- In the roughly 15 faculty hires overseen, each hire was the #1 pick in his or her search.
- Comprehensive curricular redesign. Major growth in both undergraduate and graduate enrollments.
- Reorganized departmental administration to be proactive and entrepreneurial.
- Design and launch of a successful corporate partners program.
- Achieved 2.5× external research funding for department.
- Served in several leadership roles and committees on campus.

At Brown University

- 1988–1992 Professor, Department of Computer Science.
- 1985–1988 Associate professor (with tenure), Department of Computer Science.
- 1980–1985 Assistant professor, Department of Computer Science.

Major administrative accomplishments at Brown:

- Chaired and reorganized graduate admissions committee to fully engage faculty with applicants.
- Chaired faculty search committee, undergraduate committee, and colloquium committee.
- Served on numerous committees, including those dealing with industrial partners, planning and growth, graduate affairs, curriculum, teaching effectiveness, and promotion and tenure.
- Incorporated modern teaching methodology for large new programming course.

Other Appointments

- 2008–2016 Adjunct professor, Purdue University.
- 1990–2006 Visiting professor (short-term) and/or adjunct professor, Tulane University.
- 1989–2000 Associate member, Center of Excellence in Space Data and Information Sciences (CESDIS).
- 1993–1999 Adjunct professor, Brown University.
- 1998–1999 Professeur invité, Institut National de Recherche en Informatique et en Automatique (INRIA), Sophia Antipolis, France.
- 1998 Visiting professor (short-term), University of Aarhus, Århus, Denmark.
- 1988–1989 Visiting professor (short-term), Ecole Normale Supérieure, Paris, France.
- 1987 Lecturer, 2nd Asian School on Computer Science, Bangkok, Thailand.
- 1986–1987 Directeur scientifique, Institut National de Recherche en Informatique et en Automatique (INRIA), Rocquencourt, France.
- 1986–1987 Visiting professor, Ecole Normale Supérieure, Paris, France.

- 1986 Member, Mathematical Sciences Research Institute, Berkeley, CA.
- 1977–1980 Research and teaching assistant, Stanford University.
- 1979 Teaching fellow, Stanford University.
- 1976–1977 Assistant computer performance analyst, Standard Oil Company of California, San Francisco, CA (summers).

6. Honors and Awards

- 1977–present Phi Beta Kappa.
- 1983–present Sigma Xi.
- 1986–present Listed in several national and international Who’s Who publications.
- 1986–present Fellow of the John Simon Guggenheim Memorial Foundation.
- 1993–present Fellow of the Institute of Electrical and Electronics Engineers (IEEE), for contributions to the theory of sorting and searching and to the design and analysis of computer algorithms.
- 1996–present Fellow of the Association for Computing Machinery (ACM), for contributions to the theory of information storage and retrieval and to the design and mathematical analysis of computer algorithms.
- 2009–present Fellow of the American Association for the Advancement of Science (AAAS), for distinguished contributions to the design and analysis of efficient computer algorithms and data structures, particularly those involving massive amounts of data.
- 2017–present Phi Kappa Phi.
- 2017 CEO Award of Mississippi, awarded by the Mississippi Business Journal to recognize leaders around the state who demonstrate excellence among the top executives in their field.
- 2009 SIGMOD Test of Time Award, awarded by the Association for Computing Machinery (ACM) Special Interest Group for Management of Data (SIGMOD) to the authors of the most impactful SIGMOD paper from 10 years earlier, “Approximate Computation of Multidimensional Aggregates of Sparse Data Using Wavelets,” by J. S. Vitter and M. Wang.
- 2002 Graduated as Fuqua Scholar, Fuqua School of Business, Duke University.
- 2001 Recognition of Service Award, Association for Computing Machinery (ACM).
- 1999 Medal of the University of Helsinki, Helsinki, Finland.
- 1998 Fulbright Scholar, during sabbatical in Sophia-Antipolis, France.
- 1997 Recognition of Service Award, Association for Computing Machinery (ACM).
- 1991–1992 Senior Member of Institute of Electrical and Electronics Engineers (IEEE).
- 1985–1991 National Science Foundation Presidential Young Investigator Award.
- 1984–1988 IBM Faculty Development Award.
- 1986 Honorary A.M. degree, Brown University.
- 1977–1980 National Science Foundation Graduate Fellow, Stanford University.
- 1973–1977 Notre Dame Scholar, University of Notre Dame.
- 1977 General Electric Mathematics Major Award.
- 1977 Graduated with highest honors, University of Notre Dame.

7. Professional Societies

- 1977–present Phi Beta Kappa.
- 1979–present Association for Computing Machinery (ACM) (currently Fellow) and its Special Interest Group on Algorithms and Computation Theory (ACM SIGACT).
- 1980–present Institute of Electrical and Electronics Engineers (IEEE) (currently Fellow) and IEEE Computer Society.
- 1983–present Sigma Xi.

- 1984–present European Association for Theoretical Computer Science (EATCS), with occasional lapses.
- 1986–present John Simon Guggenheim Memorial Foundation (Fellow).
- 2003–present American Association for the Advancement of Science (AAAS) (currently Fellow).
- 2017–present Phi Kappa Phi.

8. Consultancies

- Alston & Bird, Washington, DC.
- AT&T Labs–Research, Florham Park, NJ.
- Burman, Critton, Luttier & Coleman, West Palm Beach, FL.
- Center for Computing Sciences (formerly Supercomputing Research Center), Bowie, MD.
- Fish & Richardson, Atlanta, GA and San Diego, CA.
- Google, Mountain View, CA.
- IBM Academic Information Systems, Stamford, CT.
- IBM Palo Alto Scientific Center, Palo Alto, CA.
- Institute for Defense Analyses, Alexandria, VA.
- Knowledge Engineering, Inc., Cambridge, MA.
- Lucent Technologies, Bell Laboratories, Murray Hill, NJ.
- Microsoft, Redmond, WA.
- Milbank, Tweed, Hadley & McCloy, New York, NY.
- Universities Space Research Association, Columbia, MD.
- Xerox PARC, Palo Alto, CA.

9. Service to the Profession and Community

- 1979–present Referee for more than 80 distinct professional journals and conference series.
- 1980–present Technical committee, annual IEEE Symposium on Foundations of Computer Science.
- 1981–present Reviewer of research proposals and/or panel member for various agencies, including the National Science Foundation, Air Force Office of Scientific Research, Army Research Office, NASA, Natural Sciences and Engineering Research Council of Canada, and other international agencies.
- 2006–present Board of Advisors, School of Science and Engineering, Tulane University. Emeritus member (2014–present), Member (2006–2014), Technology Transfer and Business Development Committee (2009–2014), Computer Science Task Force (2010–2014), Planning and Operations Committee (2006–2009).
- 2009–present Board of Advisors, Center for Massive Data Algorithmics (MADALGO), Danish National Research Foundation, University of Aarhus, Århus, Denmark.
- 2013–present Oversight Board, Personalized Learning Consortium (PLC), Association of Public and Land-grant Universities (APLU).
- 2014–present Commission on Access, Diversity and Excellence (CADE), Association of Public and Land-grant Universities (APLU).
- 2015–present Council on Commission on Innovation, Competitiveness, and Economic Prosperity (CICEP), Association of Public and Land-grant Universities (APLU). Executive committee (2015–present).
- 2015–present Commission on Information, Measurement, and Analysis (CIMA), Association of Public and Land-grant Universities (APLU).
- 2016–present Board of Directors, University of Mississippi Foundation.
- 2016–present Board of Directors, University of Mississippi Research Foundation.
- 2016–present Council of Presidents, Association of Public and Land-grant Universities (APLU).

2016–present Board of Directors, Innovate Mississippi.

2016–present Council of Presidents, Southeastern Universities Research Association (SURA).

2016–present Rotary Club of Oxford, MS.

2016–present Board of Directors, Mississippi Association of Colleges and Universities.

2000–2016 Computing Research Association (CRA). Co-chair of Government Affairs Committee (2001–2016), Board of Directors (2000–2009), Computing Research Funding Task Force (2005–2009).

2012–2016 Advisory Committee, National Science Foundation Directorate for Computer & Information Science & Engineering.

2008–2015 Council on Academic Affairs, Association of Public and Land-grant Universities (APLU). Executive committee (2010–2015), Co-chair of Committee on Research and Graduate Education (2012–2015), Chair of executive committee (2014–2015), Past chair of executive committee (2015), Chair-elect of executive committee (2013–2014), Task Force on Graduate Program Disclosure (2010–2012).

2010–2015 Chair of Board of Directors, KU Innovation and Collaboration (KUIC).

2010–2015 Vice chair of Board of Directors, KU Center for Research (KUCR).

2010–2015 Board of Directors, Kansas Athletics, Inc. Vice chair (2012–2015), Finance and Audit Committee (2012–2015).

2010–2015 Rotary Club of Lawrence, Lawrence, KS.

2010–2015 Lawrence Chamber of Commerce, Lawrence, KS.

2013–2015 Scholarship Committee, Hall Family Foundation, Kansas City, MO.

2014–2015 AAU-ARL Task Force on Scholarly Communication, Association of American Universities (AAU) and Association of Research Libraries (ARL).

2014–2015 Co-chair of AAU Copyright Working Group, Association of American Universities (AAU).

2015 Governing Board of Directors, Bert Nash Community Mental Health Center, Lawrence, KS.

2009–2010 Rotary Club of Aggieland, College Station, TX.

2010 External review committee, Department of Computer Science, Yale University.

2008–2009 Visiting committee, Institut National de Recherche en Informatique et en Automatique (INRIA), Rocquencourt, France.

2009 Board of Directors, Research Valley Partnership, College Station, TX.

2003–2008 Proposer of concept and participant in design of what has become the Purdue University Research Expertise database (PURE) and the Indiana Database for University Research Expertise (INDURE), www.indure.org.

2006–2008 Town and Gown Club, Lafayette and West Lafayette, IN.

2007–2008 Rotary Club of West Lafayette, West Lafayette, IN.

2007 External programme review committee, Science Foundation Ireland, Dublin, Ireland.

1987–2005 Executive committee, ACM SIGACT, Special Interest Group on Algorithms and Computation Theory (formerly Automata and Computability Theory), Association for Computing Machinery. Past chair (2001–2005), Chair (1997–2001), Vice chair (1991–1997).

2003–2004 External review committee, Institute of Information Sciences, Academia Sinica, Taipei, Taiwan (Republic of China).

1999–2002 Steering committee, Workshop on Algorithm Engineering.

1997–2001 SIG Governing Board, Association for Computing Machinery.

1997–2001 Executive council, EATCS, European Association for Theoretical Computer Science.

2000–2001 United Way Leadership Council, Duke University.

1997–1999 Graduate Record Examination Computer Science Committee, Educational Testing Service, Princeton, NJ.

1999 Coauthor of National Science Foundation-sponsored report, “Challenges for Theory of Computing.”

1995–1996 Advisory Board, North Carolina Supercomputing Center, Research Triangle Park, NC.

- 1996 External review committee, Department of Computer Science, Georgetown University.
- 1995 Board of Visitors and review committee, Mathematical and Computer Science Division, Army Research Office.

10. Editorial Responsibilities

In addition to the editorial roles itemized below, Dr. Vitter has been involved in the organization of over 80 professional conferences in national and international settings, in a variety of roles as chair, program committee member, and panel or session chair.

- 1991–present Editorial board, *Theory of Computing Systems* (previously *Mathematical Systems Theory: An International Journal on Mathematical Computing Theory*).
- 2012–present Steering committee, *IEEE/ACM Transactions on Computational Biology and Bioinformatics*.
- 2015–present Advisory board, *PeerJ Computer Science*.
- 2015–present Editorial board, *PeerJ Computer Science*.
- 2014 Co-editor, *Academic Leadership in Higher Education: From the Top-down and the Bottom-up*, Rowman-Littlefield, Lanham, MD, 2015.
- 1994–2011 Editorial board, *Algorithmica*.
- 2003 Co-editor, *Proceedings of the ACM Workshop on Paradigms of Computing and Knowledge (PCK-50)*, June 2003.
- 2000 Guest co-editor, special issue of *ACM Journal on Experimental Algorithmics* on the subject of algorithm engineering, **5**, 2000.
- 1999 Co-editor, *External Memory Algorithms*, DIMACS Series on Discrete Mathematics and Theoretical Computer Science, American Mathematical Society, 1999.
- 1999 Co-editor, *Algorithm Engineering*, Lecture Notes in Computer Science, **1668**, Springer, Berlin, Germany, 1999.
- 1989–1997 Editorial board, *SIAM Journal on Computing*.
- 1988–1995 Editorial board, *Communications of the ACM*.
- 1996 Co-editor, working group report on strategic directions in storage I/O for large-scale computing, *Computing Surveys*, **28** (4), December 1996.
- 1994 Guest editor, special double issue of *Algorithmica* on the subject of Large-Scale Memories, **12**(2–3), 1994.
- 1987–1991 Editorial board, *IEEE Transactions on Computers*.
- 1988 Guest editor, special issues of *Algorithmica* on the subject of parallel and distributed computing, Part I, **3**(1), and Part II, **3**(3), 1988.
- 1985 Guest co-editor, special issue of *IEEE Transactions on Computers* on the subject of sorting, **C-34**(4), April 1985.

11. Publications

Dr. Vitter has well over 300 book, journal, conference, and patent publications. Several of them are available electronically from his online publication library, which is reachable via a link from his web page chancellor.OleMiss.edu under the tab **About/Jeff's Research Activities**.

Patents

1. R. D. Barve, P. B. Gibbons, B. K. Hillyer, Y. Matias, E. Shriver, and J. S. Vitter. “A System and Method for Modeling and Optimizing I/O Throughput of Multiple Disks on a Bus, II” United States patent No. 6,301,640, Lucent Technologies, October 9, 2001.
2. R. D. Barve, P. B. Gibbons, B. K. Hillyer, Y. Matias, E. Shriver, and J. S. Vitter. “A System and Method for Modeling and Optimizing I/O Throughput of Multiple Disks on a Bus, I” United States patent No. 6,260,108, Lucent Technologies, July 10, 2001.

3. Y. Matias, J. S. Vitter, and N. Young. “Method for Implementing Approximate Data Structures using Operations on Machine Words,” United States Patent No. 5,519,840, AT&T Corporation, May 21, 1996.
4. J. S. Vitter, K. M. Curewitz, and P. Krishnan. “Online Background Predictors and Prefetchers,” United States Patent No. 5,485,609, Duke University, January 16, 1996.
5. E. E. Lindstrom and J. S. Vitter. “External Sorting Using Key Value Distribution and Range Formation,” United States Patent No. 4,575,798, IBM Corporation, March 11, 1986.

Books and Edited Special Issues of Journals

6. R. J. Sternberg, E. Davis, A. C. Mason, R. V. Smith, J. S. Vitter, M. Wheatly, editors. *Academic Leadership in Higher Education: From the Top-down and the Bottom-up*, Rowman-Littlefield, Lanham, MD, 2015.
7. J. S. Vitter. *Algorithms and Data Structures for External Memory*, Series on Foundations and Trends in Theoretical Computer Science, Now Publishers, Hanover, MA, 2008. Also listed as Volume 2, Issue 4 of *Foundations and Trends in Theoretical Computer Science*. A shorter version appears in [117].
8. D. Q. Goldin, A. A. Shvartsman, S. A. Smolka, J. S. Vitter, and S.B. Zdonik, editors. *Proceedings of the Paris C. Kanellakis Memorial Workshop on Principles of Computing & Knowledge (PCK50)*, ACM Press, New York, 2003.
9. D. T. Hoang and J. S. Vitter. *Efficient Algorithms for MPEG Video Compression*, Wiley Series in Telecommunications and Signal Processing, John Wiley & Sons, New York, NY, 2002.
10. J. S. Vitter and C. Zaroliagis, editors. Special issue on algorithm engineering in *ACM Journal of Experimental Algorithmics*, **5**, 2000.
11. J. S. Vitter and C. Zaroliagis, editors. *Algorithm Engineering*, Lecture Notes in Computer Science, **1668**, Springer, Berlin, Germany, 1999.
12. J. Abello and J. S. Vitter, editors. *External Memory Algorithms*, DIMACS Series on Discrete Mathematics and Theoretical Computer Science, American Mathematical Society, Providence, RI, 1999.
13. J. S. Vitter, editor. Special Double Issue on Efficient Algorithms for Large-Scale Memory, *Algorithmica*, **12**(2-3), 1994, 69–71.
14. J. S. Vitter, editor. Special issue on parallel and distributed computing, part II, in *Algorithmica*, **3**(3), 1988.
15. J. S. Vitter, editor. Special issue on parallel and distributed computing, part I, in *Algorithmica*, **3**(1), 1988.
16. J. S. Vitter and W.-C. Chen. *Design and Analysis of Coalesced Hashing*, Oxford University Press, New York, NY, 1987.
17. E. E. Lindstrom, J. S. Vitter, and C. K. Wong, editors. Special issue on sorting in *IEEE Transactions on Computers*, **C-34**(4), April 1985.

Book Chapters

18. J. S. Vitter. “Bold Aspirations — A Community Effort,” in *Academic Leadership in Higher Education: From the Top-down and the Bottom-up* (edited by R. J. Sternberg, E. Davis, A. C. Mason, R. V. Smith, J. S. Vitter, and M. Wheatly), Rowman-Littlefield, Lanham, MD, 2015.
19. J. S. Vitter. “External Sorting and Permuting,” in *Encyclopedia of Algorithms* (edited by M.-Y. Kao), Springer Science + Business Media, New York, 2008, 291–297. Revised for second edition, 2015.
20. P. G. Howard and J. S. Vitter. “Arithmetic Coding for Data Compression,” in *Encyclopedia of Algorithms* (edited by M.-Y. Kao), Springer Science + Business Media, New York, 2008, 65–68. Revised for second edition, 2015.

21. “Geometric and Spatial Data Structures in External Memory,” Chapter 27 in *Handbook on Data Structures and Applications* (edited by D. Mehta and S. Sahni) CRC Press, 2005, 27.1–27.33. Revised for second edition, 2015.
22. J. S. Vitter. “Algorithms and Data Structures in External Memory,” Chapter 32 in *The Computer Engineering Handbook* (edited by V. Oklobdzija), CRC Press and IEEE Press, 2002. Revised as Chapter 16 in *The Computer Engineering Handbook*, second edition, *Digital Systems and Applications* (edited by V. Oklobdzija), 2008.
23. J. S. Vitter. “External Memory Algorithms,” Chapter 10 in *Handbook of Massive Data Sets* (edited by J. Abello, P. M. Pardalos, and M. G. C. Resende), Kluwer Academic Publishers, Boston, 2002, 359–418.
24. J. S. Vitter. “External Memory Algorithms and Data Structures,” in *External Memory Algorithms* (edited by J. Abello and J. S. Vitter), DIMACS Series on Discrete Mathematics and Theoretical Computer Science, American Mathematical Society, Providence, RI, 1999, 1–38.
25. R. D. Barve, E. F. Grove, and J. S. Vitter. “Simple Randomized Mergesorting on Parallel Disks,” in *Randomization Methods in Algorithm Design* (edited by P. Pardalos, S. Rajasekaran, and J. Rolim), DIMACS Series on Discrete Mathematics and Theoretical Computer Science, American Mathematical Society, Providence, RI, 1998, 1–20.
26. P. G. Howard and J. S. Vitter. “Practical Implementations of Arithmetic Coding,” in *Image and Text Compression* (edited by J. Storer), Kluwer Academic Publishers, Norwell, MA, 1992, 85–112.
27. K. J. Basye, T. L. Dean, and J. S. Vitter. “Coping with Uncertainty in Map Learning,” in *Autonomous Mobile Robots: Perception, Mapping, and Navigation*, (edited by S. S. Iyengar and A. Elfes), IEEE Computer Society Press, 1991.
28. J. S. Vitter and Ph. Flajolet. “Average-Case Analysis of Algorithms and Data Structures,” Chapter 9 in *Handbook of Theoretical Computer Science*, Volume A: *Algorithms and Complexity* (edited by J. van Leeuwen), Elsevier and M.I.T. Press, 1990, 431–524.
29. J. E. Savage and J. S. Vitter. “Parallelism in Space-Time Tradeoffs,” in *Advances in Computing Research*, 4, special volume on parallel and distributed computing (edited by F. P. Preparata), JAI Press, 1987, 117–146.
30. J. S. Vitter and R. A. Simons. “New Classes for Parallel Complexity: A Study of Unification and Other Complete Problems for \mathcal{P} ,” in *Computers for Artificial Intelligence Applications* (edited by B. Wah and G. J. Li), IEEE Computer Society Press, Washington, DC, 1986, 135–150.

Journal and Conference Articles

This section jointly lists Dr. Vitter’s journal and conference papers. In several cases, the journal paper is an expanded and more detailed version of a conference paper, so for purposes of succinctness, their listings are combined into a single entry. Conference papers in computer science are important in their own right; they are generally peer-reviewed, often with very low acceptance ratios.

31. J. S. Vitter. “Structure + Style = Communication,” in preparation.
32. X. Chen, H. Huo, J. Huan, and J. S. Vitter. “MSQ-Index: A Succinct Index for Fast Graph Similarity Search,” arxiv.org/abs/1612.09155, submitted.
33. H. Huo, L. Chen, H. Zhao, J. S. Vitter, and Y. Nekrich “A Data-Aware FM-index,” submitted. A shorter version appears in H. Huo, L. Chen, H. Zhao, J. S. Vitter, Y. Nekrich, and Q. Yu, “A Data-Aware FM-index,” *Proceedings of the 17th Meeting on Algorithm Engineering and Experiments (ALENEX ’15)*, San Diego, CA, January 2015, dx.doi.org/10.1137/1.9781611973754.2.
34. X. Chen, H. Huo, J. Huan, and J. S. Vitter. “Efficient Graph Similarity Search in External Memory,” *IEEE Access*, 2016, dx.doi.org/10.1109/ACCESS.2017.2682107.

35. Q. Yu, H. Huo, R. Zhao, D. Feng, J. S. Vitter, and J. Huan. “RefSelect: A Reference Sequence Selection Algorithm for Planted (ℓ, d) Motif Search,” **17**(Suppl 9), July 19, 2016, [dx.doi.org/10.1186/s12859-016-1130-6](https://doi.org/10.1186/s12859-016-1130-6). A shorter version appears in “Reference Sequence Selection for Motif Searches,” *Proceedings of 2015 IEEE International Conference on Bioinformatics and Biomedicine (BIBM '15)*, Bethesda, MD, November 2015, 569–574.
36. H. Huo, S. Li, Z. Sun, J. S. Vitter, X. Wang, Q. Yu, and J. Huan. “CS2A: a compressed suffix array-based method for short read alignment,” *Proceedings of the 2016 IEEE Data Compression Conference (DCC '16)*, Snowbird, UT, March–April 2016.
37. Q. Yu, H. Huo, X. Chen, H. Guo, J. S. Vitter, and J. Huan. “An Efficient Algorithm for Discovering Motifs in Large DNA Data Sets,” *IEEE Transactions on NanoBioscience*, **14**(5), July 2015, epublished April 9, 2015, [dx.doi.org/10.1109/TNB.2015.2421340](https://doi.org/10.1109/TNB.2015.2421340). A shorter version appears in “An Efficient Motif Finding Algorithm for Large DNA Data Sets,” *Proceedings of 2014 IEEE International Conference on Bioinformatics and Biomedicine (BIBM '14)*, Belfast, UK, November 2014.
38. J. I. Munro, Y. Nekrich, and J. S. Vitter. “Compressed Data Structures for Dynamic Sequences and Document Collections,” *Proceedings of the 34th Annual ACM Symposium on Principles of Database Systems (PODS '15)*, Melbourne, Australia, May–June 2015, 277–289.
39. Q. Yu, H. Huo, J. S. Vitter, J. Huan, and Y. Nekrich. “An Efficient Exact Algorithm for the Motif Stem Search Problem over Large Alphabets,” *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, **12**(2), March/April 2015, 384–397, [dx.doi.org/10.1109/TCBB.2014.2361668](https://doi.org/10.1109/TCBB.2014.2361668). A shorter version appears in “StemFinder: An Efficient Algorithm for Searching Motif Stems over Large Alphabets,” *Proceedings of 2013 IEEE International Conference on Bioinformatics and Biomedicine (BIBM '13)*, Shanghai, December 2013.
40. J. I. Munro, Y. Nekrich, and J. S. Vitter. “Fast Construction of Wavelet Trees,” *Proceedings of the 21st International Conference on String Processing and Information Retrieval (SPIRE '14)*, Ouro Preto, Brazil, October 2014, published in Lecture Notes in Computer Science, Springer, Berlin, Germany.
41. J. S. Vitter and J. S. Nagel. “Enhancing University Research through Engagement and Collaboration: The Office of Corporate Partnerships as a Tool in Promoting Commercialization and External Partnerships with Businesses,” in *Planning for Future Research in Public Universities in Uncertain Times* (edited by M. L. Rice), Merrill Series on the Research Mission of Public Universities, Merrill Advanced Studies Center, the University of Kansas, Lawrence, KS, July 2014, 42–48.
42. Y. Nekrich, M. Patil, R. Shah, S. V. Thankachan, and J. S. Vitter. “Categorical Range Maxima Queries,” *Proceedings of the 33rd Annual ACM Symposium on Principles of Database Systems (PODS '14)*, Snowbird, UT, June 2014.
43. W.-K. Hon, R. Shah, S. V. Thankachan, and J. S. Vitter. “Space-Efficient Frameworks for Top- k String Retrieval,” *Journal of the ACM*, **61**(2), April 2014, 9.1–9.36. A shorter version appears in W.-K. Hon, R. Shah, and J. S. Vitter, “Space-Efficient Framework for Top- k String Retrieval Problems,” *Proceedings of the 50th Annual IEEE Symposium on Foundations of Computer Science (FOCS '09)*, Atlanta, GA, October 2009, 713–722.
44. H. Huo, L. Chen, J. S. Vitter, and Y. Nekrich. “A Practical Implementation for Compressed Suffix Arrays with Applications to Self-indexing,” *Proceedings of the 2014 IEEE Data Compression Conference (DCC '14)*, Snowbird, UT, March 2014.
45. M. Lewenstein, Y. Nekrich, and J. S. Vitter. “Space-Efficient String Indexing for Wildcard Pattern Matching,” *Proceedings of the 31st Symposium on Theoretical Aspects of Computer Science (STACS '14)*, Lyon, France, March 2014, published in Leibniz International Proceedings in Informatics, Schloss Dagstuhl, Wadern, Germany.
46. W.-K. Hon, T.-H. Ku, T.-W. Lam, R. Shah, S.-L. Tam, S. V. Thankachan, and J. S. Vitter. “Compressing Dictionary Matching Index via Sparsification Technique,” *Algorithmica*, **71**, online edition January 2014, 24 pp. A shorter version appears in W.-K. Hon, T.-H. Ku, R. Shah, S. V. Thankachan, and J. S. Vitter, “Compressed Dictionary Matching With One Error,” *Proceedings of the 2011 IEEE Data Compression Conference (DCC '11)*, Snowbird, UT, March 2011, 113–122, with contributions from [72] and [68].

47. S. V. Thankachan, R. Shah, C. Sheng, and J. S. Vitter. “Top- k Document Retrieval in External Memory,” *Proceedings of the 21st Annual European Symposium on Algorithms (ESA '13)*, Sophia-Antipolis, France, September 2013, published in Lecture Notes in Computer Science, Springer, Berlin, Germany.
48. Y. Nekrich and J. S. Vitter. “Optimal Color Range Reporting in One Dimension,” *Proceedings of the 21st Annual European Symposium on Algorithms (ESA '13)*, Sophia-Antipolis, France, September 2013, published in Lecture Notes in Computer Science, Springer, Berlin, Germany.
49. S. V. Thankachan, W.-K. Hon, M. Patil, R. Shah, and J. S. Vitter. “Indexes for Document Retrieval with Relevance,” *Ian Munro Festschrift*, August 2013, published in Lecture Notes in Computer Science, Festschrift Series, Springer, Berlin, Germany.
50. Interview by M. Winslett and V. Braganholo, “Jeff Vitter Speaks Out on being a Southerner, Duties of a Dean, and More,” ACM SIGMOD series on Distinguished Profiles in Databases, transcript in *SIGMOD Record*, **42**(2), June 2013, 35–45.
51. W.-K. Hon, R. Shah, S. V. Thankachan, and J. S. Vitter. “Faster Compressed Top- k Document Retrieval,” *Proceedings of the 2013 IEEE Data Compression Conference (DCC '13)*, Snowbird, UT, March 2013.
52. W.-K. Hon, T.-H. Ku, R. Shah, S. V. Thankachan, and J. S. Vitter. “Compressed Text Indexing With Wildcards,” *Journal of Discrete Algorithms*, **19**, March 2013, 23–29. A shorter version appears in *Proceedings of the 18th International Conference on String Processing and Information Retrieval (SPIRE '11)*, Pisa, Italy, October 2011, published in Lecture Notes in Computer Science, Springer, Berlin, Germany.
53. W.-K. Hon, T.-H. Ku, R. Shah, S. V. Thankachan, and J. S. Vitter. “Faster Compressed Dictionary Matching,” *Theoretical Computer Science*, **475**, March 2013, 113–119. A shorter version appears in *Proceedings of the 17th International Conference on String Processing and Information Retrieval (SPIRE '10)*, Los Cabos, Mexico, October 2010, published in Lecture Notes in Computer Science, Springer, Berlin, Germany.
54. W.-K. Hon, R. Shah, S. V. Thankachan, and J. S. Vitter. “On Position Restricted Substring Searching in Succinct Space,” *Journal of Discrete Algorithms*, **17**, 2012, 109–114. Some results appear in shorter form in Y.-F. Chien, W.-K. Hon, R. Shah, and J. S. Vitter, “Geometric Burrows-Wheeler Transform: Linking Range Searching and Text Indexing,” *Proceedings of the 2008 IEEE Data Compression Conference (DCC '08)*, Snowbird, UT, March 2008.
55. J. S. Vitter. “Information as a Paradigm,” in *Information Systems as Infrastructure for University Research Now and in the Future* (edited by M. L. Rice), Merrill Series on the Research Mission of Public Universities, Merrill Advanced Studies Center, the University of Kansas, Lawrence, KS, 2012.
56. J. S. Vitter. “Compressed Data Structures with Relevance,” invited keynote abstract, *Proceedings of the 2012 ACM Conference on Information and Knowledge Management (CIKM '12)*, Maui, Hawaii, October–November 2012.
57. S. V. Thankachan, R. Shah, W.-K. Hon, and J. S. Vitter. “Document Listing for Queries With Excluded Pattern,” *Proceedings of the 23rd Annual Conference on Combinatorial Pattern Matching (CPM '12)*, Helsinki, Finland, July 2012, published in Lecture Notes in Computer Science, **6129**, Springer, Berlin, Germany, 185–195.
58. M. O. Külekci, J. S. Vitter, and B. Xu. “Efficient Maximal Repeat Finding Using the Burrows-Wheeler Transform and Wavelet Tree,” *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, **9**(2), March 2012, 421–429. A shorter version appears in “Time- and Space-efficient Maximal Repeat Finding Using the Burrows-Wheeler Transform and Wavelet Trees,” *Proceedings of 2010 IEEE International Conference on Bioinformatics and Biomedicine (BIBM '10)*, Hong Kong, December 2010, 622–625.

59. M. O. Külekci, W.-K. Hon, R. Shah, J. S. Vitter, and B. Xu. “ Ψ -RA: a Parallel Sparse Index for Genomic Read Alignment,” invited paper from *BIBM '10* in *BMC Genomics*, **12**(Suppl. 2), 2011, S7. A shorter version appears in “PSI-RA: A Parallel Sparse Index for Read Alignment on Genomes,” *Proceedings of 2010 IEEE International Conference on Bioinformatics and Biomedicine (BIBM '10)*, Hong Kong, December 2010, 663–668.
60. W.-K. Hon, T.-W. Lam, R. Shah, S.-L. Tam, and J. S. Vitter. “Cache-Oblivious Index for Approximate String Matching,” *Theoretical Computer Science*, **412**(29), 2011, 3579–3588. A shorter version appears in *Proceedings of the 18th Annual Conference on Combinatorial Pattern Matching (CPM '07)*, London, Ontario, Canada, July 2007, published in *Lecture Notes in Computer Science*, **4580**, Springer, Berlin, Germany, 40–51.
61. M. Patil, S. V. Thankachan, R. Shah, W.-K. Hon, T.-H. Ku, J. S. Vitter, and S. Chandrasekaran. “Inverted Indexes for Phrases and Strings,” *Proceedings of the 34th Annual ACM SIGIR Conference (SIGIR '11)*, Beijing, July 2011.
62. R. Grossi, J. S. Vitter, and B. Xu. “Wavelet Trees: From Theory to Practice,” *Proceedings of the International Conference on Data Compression, Communication and Processing (CCP '11)*, Palinuro, Italy, June 2011, 210–221.
63. M. O. Külekci, J. S. Vitter, and B. Xu. “Fast Pattern Matching via k -bit Filtering Based Text Decomposition,” invited paper from *ISCIS '10* in *The Computer Journal*, December 20, 2010. A shorter version appears in “Boosting Pattern Matching Performance via k -bit Filtering,” *Proceedings of the 25th International Symposium on Computer and Information Sciences (ISCIS '10)*, London, September 2010, published in *Lecture Notes in Electrical Engineering*, 1, **62**, Springer, Berlin, Germany, 27–32.
64. S. V. Thankachan, R. Shah, W.-K. Hon, and J. S. Vitter. “String Retrieval for Multipattern Queries,” *Proceedings of the 17th International Conference on String Processing and Information Retrieval (SPIRE '10)*, Los Cabos, Mexico, October 2010, published in *Lecture Notes in Computer Science*, Springer, Berlin, Germany.
65. J. S. Vitter. “Building Synergies,” in *Sustaining and Enhancing the Research Mission of Public Universities* (edited by M. L. Rice), Merrill Series on the Research Mission of Public Universities, **114**, Merrill Advanced Studies Center, the University of Kansas, Lawrence, KS, 2010, 26–33.
66. W.-K. Hon, R. Shah, and J. S. Vitter. “Compression, Indexing, and Retrieval for Massive String Data,” invited keynote paper in *Proceedings of the 21st Annual Conference on Combinatorial Pattern Matching (CPM '10)*, New York, NY, June 2010, published in *Lecture Notes in Computer Science*, **6129**, Springer, Berlin, Germany, 260–274.
67. S.-Y. Chiu, W.-K. Hon, R. Shah, and J. S. Vitter. “I/O-efficient Compressed Text Indexes: From Theory to Practice,” *Proceedings of the 2010 IEEE Data Compression Conference (DCC '10)*, Snowbird, UT, March 2010.
68. W.-K. Hon, T.-W. Lam, R. Shah, S.-L. Tam, and J. S. Vitter. “Succinct Index for Dynamic Dictionary Matching,” *Proceedings of the 20th International Symposium on Algorithms and Computation (ISAAC '09)*, Honolulu, December 2009, 1034–1043.
69. W.-K. Hon, R. Shah, S. V. Thankachan, and J. S. Vitter. “On Entropy-Compressed Text Indexing in External Memory,” *Proceedings of the 16th International Conference on String Processing and Information Retrieval (SPIRE '09)*, Saariselkä, Finland, August 2009, published in *Lecture Notes in Computer Science*, **5721**, Springer, Berlin, Germany, 75–89.
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71. P. Ferragina, R. Grossi, A. Gupta, R. Shah, and J. S. Vitter. “On Searching Compressed String Collections Cache-Obliviously,” *Proceedings of the 27th Annual ACM Symposium on Principles of Database Systems (PODS '08)*, Vancouver, Canada, June 2008, 181–190.

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75. A. Gupta, W.-K. Hon, R. Shah, and J. S. Vitter. “Compressed Data Structures: Dictionaries and the Data-Aware Measures,” *Theoretical Computer Science*, **387**(3), November 2007, 313–331. A shorter version appears in *Proceedings of the 2006 IEEE Data Compression Conference (DCC '06)*, Snowbird, UT, March 2006, 213–222.
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Technical Reports (information not available in previous citations)

In addition to Dr. Vitter’s book, journal, conference, and patent publications listed above, Dr. Vitter has also published a number of technical reports. The reports listed below are those that provide additional information not available in his publications.

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258. J. S. Vitter. *Analysis of Coalesced Hashing*, Ph.D. dissertation, Stanford University. Also appears as Technical Report STAN-CS-80-817, Department of Computer Science, Stanford University, August 1980.
259. J. S. Vitter. Departmental Reports, Computer Services Department, Standard Oil Company of California, summers 1976–1977.

12. Invited Talks since 2000

Dr. Vitter has given over 200 invited talks in national and international venues. His talks since the year 2000 are listed below:

- 2016 “The University of Mississippi: Growing Momentum,” Tupelo Kiwanis Club, Tupelo, MS.
 “The University of Mississippi: Growing Momentum,” West Point Rotary Club, West Point, MS.
 “The Flagship Forum,” Ole Miss Alumni Association, multiple presentations, at University, MS; Jackson, MS; New Orleans, LA; Washington, DC; Cleveland, MS; Tunica, MS; Purvis, MS; Hattiesburg, MS; Greenwood, MS; Vicksburg, MS; Memphis, TN; Oxford, MS; Clarksdale, MS.
 “BancorpSouth Rebel Road Trip,” Ole Miss Athletics, multiple presentations, at Atlanta, GA; Mobile, AL; Gulfport, MS; Meridian, MS; West Point, MS; Cleveland, MS; Oxford, MS.
- 2015 “Creating a Climate of Healthy Relationships,” panel organizer and moderator, Association of Public and Land-grant Universities 128th Annual Meeting (APLU ’15), Indianapolis, IN.
 “Data Analytics and their Institutional Uses,” panel member, Association of Public and Land-grant Universities 128th Annual Meeting (APLU ’15), Indianapolis, IN.
 “Building a Data-Informed University: Using Analytics to Guide the Academic Enterprise,” Analytics Leadership Summit, University of Utah, Salt Lake City, UT.
 “Engage KU: An Open Portal to Faculty Expertise,” Academic Analytics workshop, Laguna Beach, CA.
 “Data and Analytics in Support of Campus Decision-making,” panel member, joint session of the Association of Public and Land-grant Universities Council on Academic Affairs and Commission on Information, Measurement & Analysis Summer Meetings (APLU CAA ’15 and APLU CIMA ’15), Niagara Falls, Canada.

- “Copyright and Education,” panel member and co-chair, Association of Public and Land-grant Universities Council on Academic Affairs Summer Meeting (APLU CAA '15), Niagara Falls, Canada.
- “Scholarly Publishing and the University Research Enterprise,” panel member, Society for Scholarly Publishing 37th Annual Meeting (SSP '15), Arlington, VA.
- 2014 “Creating a Culture Where Numbers Matter — How Data Can Help Shatter Campus Silos and Elevate Student Success,” panel member, Association of Public and Land-grant Universities 127th Annual Meeting (APLU '14), Orlando, FL.
- “Public Access and University Policies,” panel member, Association of Public and Land-grant Universities 127th Annual Meeting (APLU '14), Orlando, FL.
- “Perspectives on Data and Genomic Biodiversity Research,” panel member and co-chair, Large Data Management Genomic Biodiversity Summit, the University of Kansas, Lawrence, KS.
- “Data Analytics for Student Success, Advising, and Alerts,” panel co-moderator, Association of Public and Land-grant Universities Council on Academic Affairs Summer Meeting (APLU CAA '14), Santa Fe, NM.
- “Enhancing University Research through Engagement and Collaboration: The Office of Corporate Partnerships as a Tool in Promoting Commercialization and External Partnerships with Businesses,” 2014 Retreat of the Merrill Advanced Studies Center, Nebraska City, NE.
- 2013 “Budgeting, Accounting, and Evidence-Based Decision-Making,” panel co-organizer and member, Association of Public and Land-grant Universities 126th Annual Meeting (APLU '13), Washington, D.C.
- “Open Access and Scholarly Communication,” panel member, Association of Public and Land-grant Universities Council on Academic Affairs Summer Meeting (APLU CAA '13), Stevenson, WA.
- “An Institutional Consortium for Personalized Learning,” panel member, Association of Public and Land-grant Universities Council of Presidents Summer Meeting (APLU CP '13), Washington, DC.
- “Finding your Way in a Compressed World (compressed title: &W*!h)” inaugural distinguished professor lecture, the University of Kansas, Lawrence, KS.
- 2012 “Confucius Institutes: A Model for Expanding the Public Impact of a Comprehensive, Research-based University’s Existing Strengths in China Studies,” President’s Forum on Confucius Institutes and the Host University System, 7th Confucius Institute Conference, Beijing.
- “Compressed Data Structures,” School of Information Technology Distinguished Lecture, Xidian University, Xi’an, China.
- “Compressed Data Structures,” IIS Distinguished Lecture, Institute for Interdisciplinary Information Sciences, Tsinghua University, Beijing.
- “Faculty Productivity,” panel co-organizer and member, Association of Public and Land-grant Universities 125th Annual Meeting (APLU '12), Denver, CO.
- “Efficiency and Effectiveness,” panel member, Association of Public and Land-grant Universities 125th Annual Meeting (APLU '12), Denver, CO.
- “Compressed Data Structures with Relevance,” keynote address at the 2012 ACM Conference on Information and Knowledge Management (CIKM '12), Maui, Hawaii.
- “Partnering with Your Dean,” workshop panel member, Computing Research Association Conference 2012 (Snowbird '12), Snowbird, UT.
- “Information as a Paradigm,” 2012 Retreat of the Merrill Advanced Studies Center, Nebraska City, NE.
- “Diversifying Revenue Streams in Support of Scholarly Engagement,” workshop panel member, Association of Public and Land-grant Universities Council on Academic Affairs Summer Meeting (APLU CAA '12), Washington, DC.
- 2011 “KU Bold Aspirations,” Rotary Club of Lawrence, Lawrence, KS.
- “Open Access to Scholarly Communication at KU,” panel member, Berlin 9 Open Access Preconference, Washington, DC.
- “Behavioral and Social Sciences as Key Components in National Research Initiatives,” panel moderator, 2011 Retreat of the Merrill Advanced Studies Center, Nebraska City, NE.
- “Graduate Program Disclosure Metrics,” workshop panel member, Association of Public and Land-grant Universities Council on Academic Affairs Summer Meeting (APLU CAA '11), Asheville, NC.

- 2010 “Ensuring that Public Research Universities Maintain Their Strength,” workshop panel member, Association of Public and Land-grant Universities Council on Academic Affairs Summer Meeting (APLU CAA ’10), Portland, OR.
- “Building Synergies,” 2010 Retreat of the Merrill Advanced Studies Center, the University of Kansas, Lawrence, KS.
- “Managing Up: Partnering with Your Dean,” workshop panel member, Computing Research Association Conference 2010 (Snowbird ’10), Snowbird, UT.
- “Understanding and Using Graduate Program Rankings in Computer Science,” workshop panel member, Computing Research Association Conference 2010 (Snowbird ’10), Snowbird, UT.
- “CRA Guidelines for Enhancing Faculty Recruitment,” workshop chair and panel member, Computing Research Association Conference 2010 (Snowbird ’10), Snowbird, UT.
- “Compression, Indexing, and Retrieval for Massive String Data,” keynote address at 21st Annual Conference on Combinatorial Pattern Matching (CPM ’10), New York, NY.
- “GBWT: Compressed Text Indexing in External Memory,” 5th Stringology Research Workshop, Bar-Ilan University, Ramat Gan, Israel.
- “Compressed Data Structures and Searching Document Collections for the Most Relevant Documents,” Duke University, Durham, NC.
- 2009 “Compressed Data Structures,” Leaders and Innovators Lecture Series, Texas A&M University, College Station, TX.
- “Compressed Data Structures and Searching Document Collections for the Most Relevant Documents,” inaugural talk for the University of Texas Computer Science Distinguished Lecture Series, University of Texas, Austin, TX.
- “Compressed Data Structures and Top- k Document Retrieval Problems,” University of Notre Dame, Notre Dame, IN.
- “Searching String Collections for the Most Relevant Documents,” Los Alamos Computer Science Symposium 2009 (LACSS), Santa Fe, NM.
- “Searching String Collections for the Most Relevant Documents,” Texas A&M University, College Station, TX.
- “Applying Wavelets in Database Systems,” ACM SIGMOD Test of Time Award lecture for the most impactful paper from SIGMOD ’99, 2009 ACM SIGMOD International Conference on Management of Data (SIGMOD ’09), Providence, RI.
- “Searching String Collections for the Most Relevant Documents,” University of Pisa, Pisa, Italy.
- “The Value of Connections,” keynote address at Phi Beta Kappa induction ceremony, Alpha of Texas Chapter, College Station, TX.
- 2008 “I/O-Efficient Algorithms and Data Structures,” Computing Research Association, Washington, DC.
- Interview as part of Purdue University Oral History Program Collection, interviewed by K. Markee, West Lafayette, IN.
- “Multidisciplinary Research in Universities,” U.S.–China Computer Science Leadership Summit, Arlington, VA.
- Interview as part of ACM SIGMOD series on Distinguished Profiles in Databases, interviewed by Marianne Winslett, West Lafayette, IN.
- “On Searching Compressed String Collections Cache Obliviously,” Information Theory and Applications Workshop, California Institute for Telecommunications and Information Technology, University of California–San Diego, La Jolla, CA.
- 2007 “I/O-Efficient Algorithms and Data Structures,” keynote address for inauguration of Center for Massive Data Algorithmics, Danish National Research Foundation, University of Aarhus, Århus, Denmark.
- “Hestia and Climate Change,” moderator, Roundtable Forum on Climate Change, Barnes & Thornburg LLP, Indianapolis, IN.
- “The Entrepreneurial Spirit of Purdue,” Purdue Entrepreneurship Roundtable, Palo Alto, CA.
- “From Molecules to Ecosystems: Research Foci in Purdue Life Sciences,” Indiana Health Industry Forum, Barnes & Thornburg LLP and Indiana Economic Development Corporation, Indianapolis, IN.

- “The Impact of Information Science and Technology on our Lives,” Town and Gown Club, West Lafayette, IN.
- “Lower Bounds on Encoding Length with Burrows-Wheeler Compression,” Information Theory and Applications Workshop, California Institute for Telecommunications and Information Technology, University of California–San Diego, La Jolla, CA.
- “The Impact of Computer Science and Information Technology on our Lives,” Rotary Club of West Lafayette, West Lafayette, IN.
- 2006 “Bringing Engagement to Life in Arts and Sciences Departments and Colleges,” panel member, Outreach Scholarship 2006 Conference, Columbus, OH.
- “A Nearly Tight Analysis of the Burrows-Wheeler Transform,” Workshop on Space-Conscious Algorithms, University of Bologna Residential Center, Bertinoro, Italy.
- “Issues and Challenges with Commercialization of Research,” panel member, 2006 Annual Meeting of the American Association of Universities Arts & Sciences Deans, Minneapolis, MN.
- “Compressed Data Structures: Dictionaries and the Data-Aware Measures,” Information Theory and Applications Workshop, California Institute for Telecommunications and Information Technology, University of California–San Diego, La Jolla, CA.
- 2005 “Undergraduate Programs — Curricular Objectives and Access Issues,” panel organizer, 2005 Annual Meeting of the American Association of Universities Arts & Sciences Deans, Irvine, CA.
- 2004 “Best of Both Worlds: Data Compression with Fast Indexing,” IBM Data Management Workshop, IBM Toronto Laboratory, Toronto, Canada.
- “CS Education Après le Crash,” plenary panel member, Computing Research Association Conference 2004 (Snowbird '04), Snowbird, UT.
- “Data, Data Everywhere! Compressed Indexing and Indexed Compression,” Distinguished Lecturer Series, University of Rochester, Rochester, NY.
- 2003 “Entropy-Based Space Models for Algorithms and Data Structures,” National Science Foundation Workshop on Information Theory and Computer Science Interface Chicago, IL.
- “Data, Data Everywhere!” Sciencetech Club, Indianapolis, IN.
- 2004 “Managing and Strengthening Interdisciplinary Programs,” panel member, 2003 Annual Meeting of the American Association of Universities Arts & Sciences Deans, College Park, MD.
- “How to Store and Search Massive Data Archives,” XVI Louisiana Distinguished Lecture Series, University of Louisiana–Lafayette, Lafayette, LA.
- 2002 Minicourse on “External Memory Algorithms and Parallel Disk Access,” EEF Summer School on Massive Data Sets, University of Aarhus, Århus, Denmark.
- “The Data Explosion,” Purdue University, West Lafayette, IN.
- “The Data Explosion,” the University of Kansas, Lawrence, KS.
- “Prediction via Data Compression,” Workshop on Compression Issues in Next-Generation Network Applications, DIMACS, Rutgers University, New Brunswick, NJ.
- “Compressed Indexes for Fast Search in Sequences,” keynote address at the 6th Joint Conference on Information Sciences (JCIS '02), Durham, NC.
- “Entropy-Compressed Indexes for Sequences,” Dagstuhl-Seminar on Data Structures, Schloss Dagstuhl, Wadern, Germany.
- “The Power of Duality and Randomness in Scheduling and Sorting with Multiple Disks,” KNUTHfest 2002 Symposium, Stanford University, Stanford, CA.
- 2001 “Computing on MASSIVE Data,” University of Notre Dame, Notre Dame, IN.
- “Computing on MASSIVE Data,” 16th Clemson Mini-Conference on Discrete Mathematics, Clemson University, Clemson, SC.
- “Information Technology Partnerships in Education,” TechVision 2020 Mayor’s Information Technology Summit, New Orleans, LA.
- “External Memory Algorithms: Dealing with MASSIVE Data,” Distinguished Lecture Series, Louisiana State University, Baton Rouge, LA.

- 2000 “Online Data Structures in External Memory,” Georgia Institute of Technology, Atlanta, GA.
 “Multiresolution Approximation Techniques for Database Systems,” Dagstuhl-Seminar on Data Structures, Schloss Dagstuhl, Wadern, Germany.
 “Efficient Search through Massive Data,” IBM T. J. Watson Research Center, Hawthorne, NY.

13. Research Funding

Dr. Vitter is the sole principal investigator of the grants below, except for those in which multiple co-principal investigators are listed.

- 2010–2014 National Science Foundation, “Pattern Matching for Massive Data Sets,” the University of Kansas (subcontracted from Louisiana State University, as part of a \$500,000 collaborative research grant), \$235,773.
- 2006–2010 National Science Foundation, “Performance Models and Systems Optimization for Disk-Bound Applications,” Co-Principal Investigators M. S. Thottethodi, J. S. Vitter, R. T. Shah, T. N. Vijaykumar, and V. S. Pai, Purdue University, \$889,788.
- 2004–2007 National Science Foundation, “Entropy-Compressed Data Structures,” Purdue University, \$255,000.
- 2002–2005 IBM, “Dynamic Optimization in Databases and Information Systems,” Purdue University, \$40,000.
- 2003–2005 Army Research Office, “External Memory Algorithms: Dealing with MASSIVE Data,” Purdue University, \$107,529.
- 1999–2003 National Science Foundation, “External Memory Algorithms: Dealing with MASSIVE Data,” Duke University and Purdue University, \$290,000.
- 2000–2003 Microsoft Research, “Interactive Research/Teaching Classroom,” Duke University, Co-Principal Investigators J. S. Vitter, R. Lucic, L. Arge, O. L. Astrachan, J. S. Chase, C. S. Ellis, D. Ramm, S. Rodger, and A. Vahdat, \$1,191,470.
- 2000–2003 National Science Foundation, “Algorithms for Active Storage,” Duke University, Co-Principal Investigators J. S. Vitter and J. S. Chase, \$252,000.
- 2001–2003 Army Research Office, “External Memory Algorithms: Dealing with MASSIVE Data,” Duke University and Purdue University, \$90,985.
- 1998–2002 National Science Foundation, “Geographic Information Systems on High-Speed Clusters: A Vertically Integrated Approach,” Duke University, Co-Principal Investigators J. S. Chase, P. K. Agarwal, L. Arge, P. N. Halpin, D. L. Urban, and J. S. Vitter, \$1,185,900.
- 1995–2001 Army Research Office, Multidisciplinary Research Program of the University Research Initiative, “Applicable and Robust Geometric Computing,” Co-principal investigators J. S. Vitter and P. K. Agarwal, Duke University (subcontracted from the Center for Geometric Computation at Brown University, as part of a \$4,500,000 grant with participating institutions Brown, Duke, and Johns Hopkins Universities), \$1,489,042.
- 1998–2001 U.S. Department of Education, “Fellowships in Experimental Computer Science,” Duke University, Co-Principal Investigators C. S. Ellis, L. Arge, O. L. Astrachan, J. S. Chase, G. Kedem, A. Lebeck, M. Littman, and J. S. Vitter, \$500,000.
- 2001 IBM, “The IBM/Duke Mass Storage Project, the IBM/Duke e-Education Partnership, and the IBM/Duke Pervasive Computing Initiative,” Duke University, Co-Principal Investigators J. Harer, K. Trivedi, J. Board, J. S. Vitter, R. Lucic, J. S. Chase, A. Vahdat, S. Rodger, A. Lebeck, and O. L. Astrachan, \$384,000.
- 1996–1999 National Science Foundation, “Efficient I/O Communication for High-Performance Computing,” Duke University, \$274,999 (includes a \$5,000 Research Experience for Undergraduates supplement in 1997).
- 1996–1999 National Science Foundation, “CURIOUS: Center for Undergraduate education and Research: Integration thrOUGH performance and viSualization,” Duke University, Co-Principal Investigators O. L. Astrachan, S. Rodger, P. K. Agarwal, A. W. Biermann, G. Kedem, A. Lebeck, J. H. Reif, X. Sun, J. S. Vitter, and D. J. Rose, \$405,200.

- 1999 Los Alamos Research Laboratory, "Models and Algorithms for Several Levels of Memory," Duke University, Co-Principal Investigators P. K. Agarwal, L. Arge, and J. S. Vitter, \$50,000.
- 1995–1998 National Science Foundation, "Acquisition of a Workstation Cluster Testbed for Next-Generation Collaborative Computing," Academic Research Instrumentation Program, Duke University, Co-principal investigators J. S. Vitter, J. S. Chase, C. S. Ellis, G. Kedem, and J. H. Reif, \$489,600 (plus institutional support of \$489,599).
- 1995–1998 Army Research Office, AASERT Award, "Breaking the I/O Bottleneck in Large-Scale Computation," Duke University, \$100,000.
- 1998 Microsoft Education Development Grant, Duke University, Co-Principal Investigators O. L. Astrachan, S. Rodger, and J. S. Vitter, \$50,000.
- 1993–1996 Army Research Office, "Algorithms for Processing Large-Scale Data," Duke Univ., \$211,945.
- 1993–1996 National Science Foundation, "SIMD/MIMD Parallel Computing: Computational Theory, Scientific Applications, and Systems Research," CISE Institutional Infrastructure Program, Brown University, Co-principal investigators J. S. Vitter, C. S. Ellis, C. Gardner, D. W. Loveland, J. H. Reif, and D. J. Rose, H. S. Greenside, M.-Y. Kao, G. Kedem, P. Lanzkron, and R. Wagner, \$1,420,001 (plus institutional support of \$421,209).
- 1993–1996 National Science Foundation, "Non-Equilibrium Phenomena in Nematic Liquid Crystals," Brown University, Co-principal investigators R. Pelcovits, G. Loriot, and J. S. Vitter, \$195,785.
- 1994–1996 Air Force Office of Scientific Research, "Design and Analysis of Lossless and Lossy Data Compression Methods with Applications to Communication and Caching," Duke University, \$305,311.
- 1991-1994 ARPA/ISTO, "High-Performance Design Environments," Brown University, Co-principal investigators E. Charniak, T. W. Doepfner, J. F. Hughes, P. C. Kanellakis, P. N. Klein, D. P. Lopresti, S. P. Reiss, J. E. Savage, R. Tamassia, A. van Dam, P. van Hentenryck, J. S. Vitter, P. Wegner, F. K. Zadeck, and S. B. Zdonik, \$2,654,835.
- 1991–1994 Army Research Office, "Algorithmic Issues in High-Performance Computing," Brown University (partly subcontracted to Duke University), Co-principal investigators J. S. Vitter and R. Tamassia, \$150,000.
- 1991–1994 National Science Foundation, "Algorithmic Issues in High-Performance Computing," Brown University (partly subcontracted to Duke University), Co-principal investigators J. S. Vitter and R. Tamassia, \$346,802.
- 1992–1994 Air Force Office of Scientific Research, "Design and Analysis of Lossless and Lossy Data Compression Methods with Applications to Communication and Caching," Brown University (subcontracted to Duke University), \$112,774.
- 1992–1994 National Science Foundation, "Management, Analysis and Representation of Large Scientific Databases" Brown University, Co-principal investigators L. Sirovich, F. Bisshopp, R. Everson, and J. S. Vitter, \$312,514.
- 1988–1993 National Science Foundation, "Multiparadigm Design Environments," CISE Institutional Infrastructure Program, Brown University, Co-principal investigators J. E. Savage, E. Charniak, T. L. Dean, T. W. Doepfner, P. C. Kanellakis, D. P. Lopresti, L. Morgenstern, S. P. Reiss, A. van Dam, J. S. Vitter, P. Wegner, F. K. Zadeck, and S. B. Zdonik, \$3,481,000.
- 1985–1992 National Science Foundation Presidential Young Investigator Award, "The Mathematical Analysis of Algorithms," Brown University, \$312,000.
- 1989–1992 NASA Graduate Student Research Program, "Analysis of Coding for Data Compression," Brown University, \$62,000.
- 1989–1991 IBM, "Algorithms for Manipulating Data using Systems with Parallel Architecture," Brown University, \$75,000.
- 1984–1989 National Science Foundation, "The Design and Analysis of Combinatorial Algorithms," Brown University, \$179,775.
- 1988–1989 IBM, "Algorithms for Manipulating Data using Systems with Parallel Architecture," Brown University, \$37,500.

- 1984–1988 IBM Faculty Development Award, Brown University, \$60,000.
- 1982–1987 National Science Foundation, “An Integrated Experimental Environment for Research in Computer Science,” CER Program, Brown University, Co-principal investigators A. van Dam, J. E. Savage, P. Wegner, R. Sedgewick, E. Charniak, T. W. Doepfner, S. P. Reiss, J. S. Vitter, and P. C. Kanellakis, \$2,736,377.
- 1986–1987 AT&T, “The Mathematical Analysis of Algorithms,” Brown University, \$17,500.
- 1983–1986 IBM, “The Design and Analysis of Algorithms for Sorting and Searching and VLSI,” Brown University, \$100,000.
- 1983–1986 DARPA/ONR, “Ideographics” and “A Graphical Approach to Software Development,” Brown University, Co-principal investigators J. E. Savage, A. van Dam, G. M. Baudet, E. Charniak, B. M. Chazelle, T. W. Doepfner, P. C. Kanellakis, S. P. Reiss, R. Sedgewick, J. S. Vitter, and P. Wegner, \$1,700,000.
- 1981–1984 National Science Foundation, “The Analysis and Implementation of Algorithms for Information Retrieval,” Brown University, \$33,834.
- 1981–1982 IBM, “The Design and Analysis of Algorithms for Sorting and Searching,” Brown University, \$30,000.

14. Theses

- 2012 External examiner of Ph.D. thesis of Cheng Sheng, *Algorithms with Theoretical Guarantees for Database Problems*, The Chinese University of Hong Kong.
- 2010 External reviewer of Ph.D. thesis of Rossano Venturini, *On Searching and Extracting Strings from Compressed Textual Data*, University of Pisa.
- 2007 Supervision of Ph.D. thesis of A. Gupta, *Succinct Data Structures*, Duke University (revised 2010).
- 2004 Supervision of Ph.D. thesis of L. Lim, *On-line Methods for Database Optimization*, Duke University.
- 2004 Committee member for Ph.D. thesis of I. Ilyas, *Rank-aware Query Optimization*, Purdue University.
- 2002 Supervision of Ph.D. thesis of O. Procopiuc, *Algorithms for Very Large Spatial Databases*, Duke University.
- 2001 Committee member for Ph.D. thesis of C. Procopiuc, *Efficient Algorithms for Geometric Clustering Problems*, Duke University.
- 2001 Supervision of Ph.D. thesis of A. I. Natsev, *Multidimensional Retrieval by Regions, Concepts, and Constraints*, Duke University.
- 2000 Committee Member for Ph.D. thesis of P. Desikan, *Issues in Interactive Rendering: Theory and Practice*, Duke University.
- 1999 Supervision of Master’s thesis of S. Luoma, *A Robust Algorithm for Constructing a BSP of Polygons in \mathbb{R}^3* , Duke University.
- 1999 Supervision of Ph.D. thesis of M. Wang, *Approximation and Learning Techniques in Database Systems*, Duke University.
- 1999 Supervision of Ph.D. thesis of T. M. Murali, *Efficient Hidden-Surface Removal in Theory and in Practice*, Brown University.
- 1998 Supervision of Ph.D. thesis of R. D. Barve, *Algorithmic Techniques to Overcome the I/O Bottleneck*, Duke University.
- 1998 Committee member for Ph.D. thesis of K. R. Varadarajan, *Algorithms for Some Geometric Optimization Problems: Navigation, Simplification, and Matching*, Duke University.
- 1997 Reporter for doctoral thesis of F. Bertault, *Génération et tracé de structures décomposables*, Henri Poincaré University.
- 1997 Supervision of Ph.D. thesis of D. T. Hoang, *Efficient Algorithms for Text and Video Compression*, Brown University.
- 1997 Supervision of Ph.D. thesis of D. E. Vengroff, *The Theory and Practice of I/O-Efficient Computation*, Brown University.

- 1997 Committee member for Ph.D. thesis of S. Chen, *Algorithmic Applications of Data Compression Techniques*, Duke University.
- 1997 Committee member for Ph.D. thesis of P. Ferragina, *Dynamic Data Structures for String Matching Problems*, University of Pisa,
- 1996 Committee member for Ph.D. thesis of A. Purakayastha, *Characterizing and Optimizing Parallel File Systems*, Duke University.
- 1995 Committee member for Ph.D. thesis of J. Subramanian, *Dynamic Resource Management for a Network under Stochastic Demand*, University of North Carolina at Chapel Hill.
- 1995 Supervision of Ph.D. thesis of P. Krishnan, *Online Prediction Algorithms for Databases and Operating Systems*, Brown University.
- 1995 Supervision of Ph.D. thesis of S. Subramanian, *Parallel and Dynamic Shortest-Path Algorithms for Sparse Graphs*, Brown University.
- 1993 Supervision of Ph.D. thesis of P. G. Howard, *The Design and Analysis of Efficient Lossless Data Compression Systems*, Brown University.
- 1993 Supervision of Master's thesis of K. M. Curewitz, *Practical Prefetching via Data Compression*, Brown University.
- 1993 Committee member for Ph.D. thesis of K. J. Basye, *A Framework for Map Construction*, Brown University.
- 1993 Supervision of Ph.D. thesis of M. H. Nodine, *Minimizing the Input/Output Bottleneck*, Brown University.
- 1992 Committee member for Ph.D. thesis of R. F. Cohen, *Combine and Conquer*, Brown University.
- 1992 Committee member for Ph.D. thesis of A. A. Shvartsman, *Fault-Tolerant and Efficient Parallel Computation*, Brown University.
- 1992 Supervision of Ph.D. thesis of J.-H. Lin, *Approximation Algorithms and Complexity Results for Machine Learning*, Brown University.
- 1991 Committee member for Ph.D. thesis of A. K. Agrawal, *Network Design and Network Cut Dualities: Approximation Algorithms and Applications*, Brown University.
- 1991 Committee member for Ph.D. thesis of R. Ravenscroft, *Generating Function Algorithms for Symbolic Computation*, Brown University.
- 1990 Committee member for Ph.D. thesis of R. J. Calistri, *Classifying and Detecting Plan-Based Misconceptions for Robot Plan Recognition*, Brown University.
- 1990 Supervision of the Master's thesis of E. A. Shriver, *Optimal Disk I/O and Memory Access with Parallel Block Transfer*, Brown University.
- 1989 Committee member and reporter for doctoral thesis of D. Gardy, *Bases de données, allocations aléatoires : quelques analyses de performances*, University of Paris.
- 1989 Committee member for Ph.D. thesis of J. T. Stasko, *TANGO: A Framework and System for Algorithm Animation*, Brown University.
- 1988 Committee member and reporter for doctoral thesis of C. M. Kenyon (née Mathieu), *Comparaison de modèles combinatoires et probabilistes : deux exemples en Analyse d'Algorithmes*, Ecole Normale Supérieure and University of Paris.
- 1986 Committee member for Ph.D. thesis of P. Celis *Robin Hood Hashing*, University of Waterloo,
- 1985 Supervision of Master's thesis of J. T. Stasko, *Pairing Heaps: Experiments and Analysis*, Brown University.
- 1985 Supervision of Ph.D. thesis of W.-C. Chen, *The Design and Analysis of Coalesced Hashing*, Brown University.
- 1983 Supervision of Master's thesis of R. A. Simons, *On Bounded Depth Parity Circuits*, Brown University.

Dr. Vitter's former 15 Ph.D. students are currently employed at Akamai, Apple, Avaya Labs, Butler University, Google (2), Microsoft, National Taiwan University, Navini, RichRelevance, University of Hawaii, Veveo, Virginia Tech, Visa Research, and Zenverge.

15. Postdoctoral Assistants

Stergios Anastasiadis, Lars Arge, Julien Basch, Edward F. Grove, Wing-Kai Hon, Paul G. Howard, David Hutchinson, Oğuzhan Külekci, Philip M. Long, Yakov Nekrich, Rahul Shah, Saswata Shannigrahi, and Bojian Xu.