



Chicago's Jesuit University

LOYOLA  
UNIVERSITY  
CHICAGO

**Chandra N. Sekharan, Ph.D.**  
**Professor**  
**Department of Computer Science**

## Curriculum Vitae

### Education

- Ph.D. Mathematical Sciences, Clemson University, South Carolina. Thesis Title: "Parallel Algorithms and Enumeration Techniques for Partial  $k$ -Trees", 1989.
- M.S. Computer Science, School of Computer Science and Automation, Indian Institute of Science, India, 1985.
- Ph.D. Scholar, Department of Computer Science, Indian Institute of Technology, Mumbai, India, 1983.
- B.S. Electrical Engineering and Electronics, Indian Institute of Science, India, 1982.
- B.S. (Major: Physics, Minors: Chemistry and Mathematics) Madurai University, India. 1979.

### Summary of Administrative and Academic Experience

- Professor Department of Computer Science, Loyola University of Chicago, 2002-present.
- Assistant to Provost: July 2010 – June 2012: Led the implementation of two university-wide initiatives (summer online classes and January term) to improve student access to classes and student retention.
- Chairperson, Department of Computer Science, Fall 2005 to Spring 2012: 20 faculty and administrators, staff 2.25 FTE. Oversight of 7 ug programs, 4 graduate programs, and 2 minors.
- American Council on Education Fellow, 2009-2010: Leadership development at University of Wisconsin-Stout, University of Wisconsin System Administration (Madison), and Northeastern Illinois University (Chicago). Focus Topics: strategic planning, university-industry partnerships, budgeting and finance, enrollment management, working with the board, and government relations.
- Associate Professor Department of Computer Science, Loyola University of Chicago, 1995-2001. Tenured in 1995.
- Assistant Professor Department of Mathematics and Computer Science, Loyola University of Chicago, 1993-1995.
- Assistant Professor Center for Parallel Computation, Department of Computer Science, University of Central Florida, 1989-1993.

## **Significant Accomplishments**

- Led university-wide implementation of offering summer online classes for undergraduates involving five colleges. This involved working with Deans, Chairs, and Program Directors from the School of Business Administration, Social Work, College of Arts and Sciences, Communication, and Nursing.
- Led university-wide implementation of a new two-week January intersession that offers a mix of online and on-campus classes from five colleges. Both initiatives were designed to promote student retention and access to classes and are now integrated into the standard university schedule.
- Provided leadership for the development and implementation of a strategic plan for the department. This resulted in the creation of new majors and minors, and professional master's programs that led to doubling of undergraduate enrollments and tripling of graduate enrollments.
- Provided leadership to foster industry-department relationship which garnered corporate grants worth \$200,000.
- Collaborated with English to establish the Center of Excellence in Digital Textual Studies. In addition, a professional MA program in Digital Humanities was introduced in 2011 under the auspices of the Center.
- Established industry advisory group and social networking presence for alumni, and improved student research with faculty.
- Provided leadership to partner with National Center for Woman & Information Technology (NCWIT) to attract and retain women in technology and computer science. Currently serving as Co-PI in an NSF grant that has provided \$5000 in scholarships to over 100 students to under-represented student groups in computer science.
- Sought and obtained funding to establish computer laboratories with high-end server infrastructure, and nVIDIA graphics based workstations.

## **Experience in Budget Management and Finance**

- Seven years of experience managing budget as Chair of the department of computer science.
- Five years of experience managing TA budget and student activity accounts as graduate program director.
- 25 years of experience managing budget as PI or Co-PI for complex projects funded by government and private agencies, including managing multiple accounts concurrently.
- Worked with the provost's office in preparing proposals and budget requests (faculty pay, incentives, equipment, information technology resources, space, and training) for launching summer online and January term initiatives.
- Interfaced with Faculty Administration in reviewing and approving faculty incentive pay and contracts for summer online and January term classes.
- Studied budget models at Loyola, UW System, UW Stout campus, and Northeastern Illinois University.

- Facilitated breakout sessions in planning and budgeting at the national conference for College and University Business Officers (NACUBO) on *Integrated Planning and Budgeting*, 2010.

### **Strategic Planning, Facilities and Resources Planning**

- Led the development of the first strategic plan for the department, as chair, that resulted in substantial growth in enrollments, new faculty hires, new and exciting academic programs, additional resources for faculty, and scholarships for students.
- Researched best practices in strategic planning, budgeting and finance, prepared reports and made presentations on resource development, resource allocation and evaluation during the ACE fellowship year. Studied the strategic plan for educational attainment in University of Wisconsin System and its 26 campuses.
- Developed a plan for housing students during the January term by working with Facilities, Residence Life, Student Affairs, Institutional Research and Associate Deans.
- Developed timeline, schedule of activities, and plans for summer online and January term initiatives that led to their successful and timely implementation.
- Led the development of laboratory space, server equipment space, and conference room space, as chair of the department. Facilitated the consolidation of faculty office space in Lewis Towers from two floors to a contiguous space on a single floor.
- Led the department through an iterative refinement of teaching load policy to conform to the college and university guidelines using data collected from peer departments.
- Designed and implemented guidelines for collecting data on online programs and classes from all schools at the university to meet Higher Learning Commission's reporting requirements.

### **Administrative Experience and Leadership Development**

**Assistant to Provost (2010-2012):** In this role, I led the implementation of two key initiatives to improve access to classes and student retention. These initiatives along with reduction of graduation credits to 120 were instrumental in improving the 6-year graduation rate and retention by 2 to 3 percent.

- The first initiative was designed to make high demand undergraduate classes available online in the summer. I worked with deans, chairs, faculty and administrators in five colleges to make it successful. Key steps included (i) training faculty in the best practices of teaching online and conducting workshops, (ii) establishing an online learning web portal, (iii) identifying the right mix of classes and participating faculty, (iv) developing a marketing plan, and (v) ensuring proper reporting to Higher Learning Commission.
- The second initiative was a new two-week intersession, called the January Term, designed to help undergraduate students get ahead in studies. My responsibilities included comprehensive planning and integration of all functions of the university relevant to the inauguration of a new term, such as Student Development, Libraries, Human Resource, Residence Life,

Financial Aid, Bursar's Office, Facilities, University Marketing, Information Technology Services, Registrar's Office, and Enrollment Management.

### **Chairperson, Department of Computer Science (2005-2012)**

- Academic Programs: Oversight of undergraduate degrees in Computer Science, Information Technology, Communication Networks and Security, Software Engineering, Mathematics and Computer Science, Physics and Computer Science, Bioinformatics; Graduate degrees in Computer Science, Software Engineering, Information Technology, Digital Humanities (MA) and School Technology (M.Ed.); Minors in Computer Science, and Computer Crime and Forensics.
- Faculty Productivity: Hired 10 new faculty members (full and part-time). During my tenure as chair, faculty published 74 articles in conferences and journals and obtained extramural research grants totaling \$2.2 million. Department was ranked 3rd within the College for funding received per full-time faculty member in the year 2009.
- Supporting the Mission and the College's Strategic Goals: Introduced a required course in Computer Ethics for our majors, achieved FT: PT faculty ratio of 5:1 in teaching introductory classes exceeding set target, promoted interdisciplinary work (teaching and research) among faculty, and improved internal operational efficiency.
- Student Engagement: Committed the department to *engaged learning* of students by requiring a capstone research course or internship supervised by faculty. From 2005-2012, more than 400 students either did independent study with faculty or had internship experience in the industry.
- Fundraising: In addition to research grants, the department raised more than \$200,000 in corporate gifts and grants for student scholarships, equipment, and laboratory needs. Donor companies included Hewlett Packard, Allston Trading, Hostway, Microsoft, McKeesson Healthcare, and Integrated DNA Technologies.
- Student Enrollments: Student enrollments at undergraduate and graduate levels more than doubled. Graduate student profile steadily improved to include several Fulbright scholars and higher GPA of entering class. In terms of size, CS graduate program grew to become the largest in the Graduate School.
- Alumni Connections: Department has established alumni connections that serve to enhance relationship between alumni, employers and current students by having a presence in LinkedIn, Facebook and Twitter. This allows networking between current students, employers, and alumni for employment and internship opportunities.
- Student Accomplishments: ACM student programming team consistently performed well in the regional competitions of ACM finishing in the top 5 typically. Eight majors have won the Fifty-for-the-Future award from Illinois Technology Foundation. Three other majors achieved high distinction in the Illinois Technology Association Challenge in fall 2011.

- **American Council on Education Fellow, 2009-2010**

Hosted at University of Wisconsin-Stout, University of Wisconsin System Administration (Madison), and Northeastern Illinois University (NEIU), Chicago. Goals for study and immersive experience included: strategic planning, industry-university partnerships, change management, budgeting and finance, working with the board, and government relations. Representative sample activities and accomplishments are given below.

- Researched best practices in strategic planning: plan development, implementation, resource allocation and assessment.
- Studied enrollment management models at UW Stout and UW System Administration and developed a new enrollment model for UW Stout.
- Visited Rose Hulman Ventures with UW Stout's Director of Discovery Center and wrote a report on industry-university partnership models.
- Studied factors leading to improved student success and better retention at Northeastern, worked with Student Development and Academic Affairs to develop synergistic strategies for improving the graduation rate at NEIU, wrote a report and made a presentation to the cabinet for its consideration.
- Researched the challenges first generation students face in achieving success at NEIU and made a presentation to NEIU's cabinet.

### **University Service**

- Chair of the Core Review Committee for Quantitative Knowledge area, 2011.
- Mentor for 1<sup>st</sup> generation college students, Achieving College Excellence, 2011-2013.
- Chair, subgroup on distance learning and satellite campuses of the Provost's Task Force on Distance Learning and Global Education, 2009-2010.
- Participated in the President's retreat -- July 2010.
- Representative to Chicago Mayor's Council of Technology Advisors, 2007.
- Member of Presidential Advisory Council, Loyola University Chicago, 2005.
- Member of the search committee for Vice President of Information Technology Services, 2005.
- Member of search committee for the Senior Associate Dean - SCTPS, 2004.
- Invited speaker at the Emergency Management Planning and Recovery workshop for Federal agencies in Chicago based on NIST standards, 2003.
- Member of Loyola's Information Technology Steering Committee: 1998-2000
- Member of the Graduate Studies Coordinating Board: 1998-1999.
- Member of the Executive Committee of the Graduate School: 1998-1999.
- Member of the Task Force for Merging Master's and Ph.D. Councils (1996).
- Member of the Mundelein Committee for developing certificate and short courses in computer science for Chicago area professionals (1995-96).

## **College and Department Service**

- Acting Graduate Program Director, Spring 2017.
- Promotion Committee chair for faculty members, 2015-16.
- Online MS: Information Technology program committee, 2012-2014.
- Member of the Dean's Administrative Reductions Committee, 2011.
- Chair of the search committee for Criminal Justice Chair, 2010-2011.
- Annual Loyola Science Fair participation, 2005- 2011.
- Computer Science Program Assessment, 2007-2008.
- Graduate Program co-Director, 2005-2006.
- Chair of the space planning committee: 2003-2004
- Chair of the Bioinformatics Committee: 2002-2003
- Curriculum Committee member of Academic Council: 1999.
- Graduate Program Director in Computer Science, 1995-1999.
- Chair and member of search committees for faculty: 1997-2000.
- Undergraduate Computer Science Curriculum Committee (1993-1996)
- Hiring computer Science Committee (1993-94)
- Student Recruiting Committee (1993-96)
- Computer Laboratory Committee (1995-01)
- Chair of the Hiring Committee (1995-97)
- Computer science Internship Committee (1996-01)
- Space Committee (1995-96)
- Assembler/Architecture/Discrete Mathematics Subcommittee (1997)
- Short course instructor for Oracle Database Administration for industry professionals (Fall 1997).

## **Outreach and Industry Consulting**

- ABET Expert – Program Evaluator, 2015-present.
- Intellectual Property Consultant for Niro, Haller and Niro LLP, 2013-2014.
- American Council on Education Fellows Program – Evaluator of candidates, 2011.
- External Reviewer for Computer Science, St. Louis University, 2009.
- External Reviewer for Computer Science, Northeastern Illinois University, 2010.
- Intellectual Property Consultant for Wildman, Harold, Allen and Dixon LLP, 2007 to 2008.
- US Army Research Laboratories, 2002-2004.
- United Airlines, Corporate R & D. Mt. Prospect, IL, 2000-2001.
- United Airlines, Corporate R & D. Mt. Prospect, IL, 1999-2000.
- “Oracle PL-SQL Issues in Supplier Database”, Consultant, Amoco Chemicals, Lisle, IL February, 1998.
- Science Applications International Corporation, 1992-1995.

## **Honors and Awards**

- American Council on Education Fellow, 2009-2010.
- Selected for the Summer Faculty Research Program at US Army Research Laboratories, 2002 and 2003.
- Nominated for Graduate Faculty of the Year at Loyola University of Chicago 1999.
- Who's Who of the South and Southwest, 1992.
- Who's Who of the Young Professionals, 1993.
- Commendation for Excellent Performance in Doctoral Studies, 1989.

## **Interdisciplinary Work and Program Development**

- Member of the Steering Committee for creating a Minor in Information, Communication, and Technology in collaboration with Communication, Fine Arts, Sociology and Marketing, 2001.
- Chaired the committee that developed a new major in Bioinformatics jointly with the Departments of Biology, Chemistry and Mathematics and Statistics, 2005.
- Led the development of a joint MS: Information Technology degree program with the School of Business, 2005.
- Launched a new minor "Computer Crime & Forensics" in collaboration with the Department of Criminal Justice, 2008.
- The department created a new M.Ed. School Technology program offered by the School of Education, 2007.
- Launched a professional MA program in Digital Humanities, 2011.

## **Teaching**

I enjoy developing new courses and revising existing courses to include new learning modules. I take pride in integrating research in the courses I teach and bring relevant industry perspectives to the classroom. I have taught at bachelor's, master's, and doctoral levels and received consistently high ratings on student evaluations.

### Undergraduate Courses Taught

- Object-Oriented Programming
- Data Structures
- Discrete Structures
- Computer Networks
- Concrete Mathematics
- Database Systems (Online)
- Data Warehousing and Data Mining
- Introduction to Parallel Computing
- Design and Analysis of Algorithms

### Graduate Courses Taught

- Parallel Computing Concepts

- High Performance Computing
- Database Programming
- Design and Analysis of Algorithms
- Graphical Network Programming
- Operating Systems
- Special Topics: in Parallel Algorithms and Architectures (for PhD students, UCF)
- Current Topics in Algorithms (for PhD students, UCF)
- Advanced Topics in Parallel Algorithms (for PhD students, UCF)
- Parallel Architectures and Algorithms (for PhD students, UCF)
- Advanced Topics in Graph Algorithms (for PhD students, UCF)

### **Research Grants and Outreach**

- “Center for System-Level Modeling of Community Resiliency – SECURE Center”, submitted to National Institute of Standards and Technology, via University of Oklahoma, \$650,000, 2014.
- “ExCEL: Excellence in Computing at Every Level”, National Science Foundation, Dept. of Undergraduate Education, \$600,000, 2008-2014.
- “Allston Scholarships in Computer Science”, Allston Trading LLC, \$12,500, 2007.
- “Community Information Technology Entrepreneurship Project”, an Open-Source Accounting Software Project, National Science Foundation, 2002-2005, \$1,000,000. (Co-PI).
- “Research Education for Undergraduates in CITEP”, National Science Foundation, Supplemental Grant – \$8,000. Co-PI, 2005.
- “High Performance Computing in Bioinformatics”, Project Personnel, DARPA, \$3,000,000, 2003.
- “Routing on High-Performance Networks using Active Monitoring of Network Parameters”, National Science Foundation, High Performance Network Connectivity, \$150,000, Sept. ’02-August ’05 (Co-PI).
- "Concurrency and Interactivity", Sun Microsystems Inc., Hardware Grant, \$90,000, 1998 - 2000. (with Colby, Jagadeesan, Dordal, and Laufer).
- “Oracle Software Grant” software valued at \$900,000, 1996.
- Microsoft Software Grant Software valued at \$68,000, with Laufer and Jagadeesan.
- “Battlefield Simulation on a Massively Parallel Computer”, PI, SAIC, US Army Subcontractor, \$56,000. Sep. 1993, June 1995.
- “Outstanding Issues in the Design of Parallel Algorithms for Partial k-Trees”, PI, National Science Foundation Award, \$36,000. Period: July 1991 to August 1994.
- “Parallel Computation in the Undergraduate Computer Science Curriculum” with (Guha et al) Co PI: January 1992 to December 1993 Total amount \$ 560,000, National Science Foundation.



## Peer Reviewed Publications

- “Queryable Compression for Massive Streaming Social Networks”, IEEE Big Data, December 2017. (with B.Nelson, and S. Radhakrishnan).
- “A Probabilistic Graphical Model for Learning as Search”, IEEE 7th Annual Computing and Communication Workshop and Conference (CCWC), Jan 2017.
- “On compressing massive streaming graphs with Quadtrees”. IEEE International Conference on Big Data, pp.2409-2417, 2015. (with Nelson, Chatterjee, Radhakrishnan).
- “Comparative Study and Performance Evaluation of Online Ad Blockers”. International Conference on Information Science and Security (ICISS), IEEE Press, pp: 1-4, Dec. 2015. (with Elliott Post)
- “Connecting the dots: Triangle completion and related problems on large data sets using GPUs”, IEEE Workshop on Big Data, October 2014.
- “Introducing PDC topics into CS1/2 and a Mobile- and Cloud-Based Intermediate Software Design Course”, *Poster presentation*, Third NSF/TCPP Workshop on Parallel and Distributed Computing Education, 2013 (with Laufer, and Thiruvathukal).
- “PDC Modules for Every Level: A Comprehensive Model for Incorporating PDC Topics into the Existing Undergraduate Curriculum”, 1st NSF/TCPP Workshop on Parallel and Distributed Computing Education, 2011.
- "Delay Constrained Sub-tree Homeomorphism Problem with Applications", IEEE *Transactions in Parallel and Distributed Computing*, Vol. 22, 12, pp: 1978 – 1985, Dec. 2011. (with Banik, Radhakrishnan)
- “On the Heterogeneous Postal Delivery Model for Multicasting”, *Journal of Communications and Networks*. vol.13:pp536-543, Oct. 2011. (with Sarangan, Radhakrishnan).
- “Implementation of Distributed Protocols on Overlay Networks”, *IEEE Transactions on Parallel and Distributed Systems*, vol. 19, 8, pp.: 1057-1070, 2008. (with Banik and Sridhar).
- “Multicast Routing with Delay and Delay Variation Constraints for Collaborative Applications on Overlay Networks”, *IEEE Transactions on Parallel and Distributed Systems*, vol. 18, 3, pp.: 421-431, March 2007. (with Banik, and Sridhar).
- “*In silico* retrieval and cataloging of GenBank DNA sequences adjacent to interspersed repetitive elements”, Bioinformatics Conference, Poster, Northwestern University, October, 2007 (with Akhtar, Laten, and Steinway).
- “Distributed Floor Control Protocols for Computer Collaborative Applications on Overlay Networks”. First IEEE International Conference on Collaborative Computing: Networking, Applications and Work-sharing (CollaborateCom 2005), San Jose, CA, pp: 10, December 2005.
- “Community Information Technology Entrepreneurship Project”, Conference on ACMSIG Information Technology Education, Extended Abstract, 2005. (with G. Thiruvathukal).
- "Multicast Routing for Multimedia Applications," Proceedings of the 7th IEEE International Conference on High Speed Networks and Multimedia

- Communications (HSNMC 2004), Toulouse, France, July 2004, LNCS 3079, pp. 399-411. (with R. Sridhar).
- “Fusion-Oriented Real-time Multi-Agent Testbed for the Future Force”, US Army Research Laboratories, White Sands Missile Range, Proceedings SCI 2004, July 2004. (Dumais, Raby, and Tenmi).
  - “Performance evaluation of wireless TCP with rerouting in mobile Networks”, Gopal Racherla, Sridhar Radhakrishnan, Chandra N. Sekharan, Computer Communications Vol. 26, pp. 542–551, 2003.
  - “Protocol for Dynamic Ad-Hoc Networks Using Distributed Spanning Trees,” S. Radhakrishnan, G. Racherla, Chandra N Sekharan, N.S.V. Rao, and S.G. Batsell, Wireless Networks Vol. 9, pp. 673-686, 2003.
  - “Interaction of Wireless TCP Schemes and Rerouting: Analytical Models and Simulation”. W. S. Al-Numay, Radhakrishnan Sridhar, T. Zheng, Chandra N. Sekharan , IEEE International Conference on Distributed Computing Systems Workshop pp. 883-889, Rhode Island, May 2003.
  - “Duplicating Delays in Network Multicasting: Model, Algorithm, and Validation” C.N. Sekharan, S. Radhakrishnan, S.M. Banik, and N.S.V. Rao , International Conference on Communications, Internet, and Information Technology CIIT Scottsdale, AZ, pp. 541-546, October 2003
  - “Data Warehousing System for Integrated Weather Analysis (SIWA) for the Objective Force”, Chandra N Sekharan, Y.Kanitkar, and Barbara Broome,
  - Proceedings of World Multiconference on Systemics, Cybernetics and Informatics, Orlando, Florida, pp. 775-781, July 2003.
  - "Fast Parallel Reordering and Isomorphism Testing of k-trees", Algorithmica, Springer-Verlag., 2002.
  - “Scalability of International Fare Construction on High Performance Supercomputers”, IEEE Proc. High Performance Computing, December 2002.
  - "Performance of Wireless TCP under different Routing Techniques in Mobile Networks", IEEE Region Ten Conference on Computers, Communications and Controls (TENCON 99), December 2000. (with Racherla, and Sridhar).
  - "DST-A Routing Protocol for Adhoc Networks using Distributed Spanning Trees", 1999 IEEE Wireless Communications and Networking Conference, Sep 1999, New Orleans, pp.100-104. (with Racherla, Sridhar, Rao and Batsell).
  - "L(2,1) problem on recursive families of graphs", Lecture Notes in Computer Science, Springer-Verlag, 2000.
  - "Performance of Wireless TCP under different rerouting schemes in Mobile Networks", IEEE Region Ten Conference on Computers, Communications and Controls (TENCON 99), December 1999. (with Racherla, and Sridhar).
  - "DST-A Routing Protocol for Adhoc Networks using Distributed Spanning Trees", 1999 IEEE Wireless Communications and Networking Conference, Sep 1999, New Orleans, pp.100-104. (with Racherla, Sridhar, Rao and Batsell).
  - “Solving the All-Pair Shortest Path Query Problem on Interval and Circular-Arc Graphs”, Networks, vol 31, 4, July 1998. (with D. Chen, D.T.Lee, and R. Sridhar).
  - "A Distributed Rerouting Algorithm for Mobile-Mobile connections in Connection-oriented Networks", in Proc. 7th International Conference on Communication and Networks, pp: 249-257, 1998. (with Sridhar and Racherla).

- "Interaction and Concurrency in the Curriculum - A Sophomore Course", in Proc. of the OOPSLA Workshop on Education, 1998. (with Colby, Jagadeesan, and Laufer).
- "Parallel Algorithms on Doubly Chordal Graphs", in Proc. of High Performance Computing Conference, Taiwan, Korea, 1997. (with R. Sridhar).
- "Unified All-Pairs Shortest path algorithms for Chordal Hierarchy", Discrete Applied Mathematics, Vol. 77, pp: 59-71, 1997. (with R. Sridhar and K. Han)
- "Space-time Trade-offs in the Relative Unranking of Binary Trees", Computer Journal, vol. 39, No.1, and pp: 36-44, 1996. (with J. Del Greco)
- "MasPaWS - A Massively Parallel War Simulator", Simulation Practice and Theory 4, pp: 265-282, 1996.
- "Load Balancing Methods for Ray Tracing and Binary Tree Computing Using PVM", Parallel Computing, 21, pp: 1963-1978, 1995. (with R.Sridhar and V. Goel).
- "Highly Parallelizable Problems on Sorted Intervals", Parallel Computing, 21, pp: 433-446. 1995 (with R. Sridhar)
- "Efficient Algorithms for Shortest Distance Queries on Special Classes of Polygons", Theoretical Computer Science, vol. 140, pp. 291-300, 1995.
- "Efficient Algorithms for Computing Matching and Chromatic Polynomials in Series-Parallel Graphs", (with Hannenhalli) Journal of Combinatorial Mathematics and Combinatorial Computing, Vol. 15 pp.19-32, 1994.
- "Enumeration Techniques for Certain k-Terminal Families of Graphs", Journal of Combinatorics, Information and System Sciences 19, No.3-4, and pp: 131-148, 1994 (with S.T. Hedetniemi and T. Wimer).
- "The k-Neighbor, r-Domination Problem on Interval Graphs", European Journal of Operational Research, Vol. 79, 2, pp: 352-368, 1994. (with R. Sridhar and D. Joshi).
- "Massively Parallel Battlefield Simulation", in Proc. of Winter Simulation Conference, Orlando, FL, pp: 744-751, Dec. 1994.
- "Efficient Parallel Algorithms for Finding Chordless Cycles in Graphs", Parallel Processing Letters, Vol. 3, and No.2 pp. 165-170, 1993.
- "On the Number of Independent Sets of Nodes in a Tree", Fibonacci Quarterly, (with R. Dutton and B. Brigham), pp. 98-104, May 1993.
- "A Fast Algorithm for Generalized Network Location Problems, in the Proceedings of the 1993 Symposium on Applied Computing, pp. 701-708, 1993. (with D.S. Joshi, R. Sridhar).
- "Ray Tracing and Scheduling Binary Tree Computations in a Distributed System Using PVM", in Mini-track in Distributed Systems, HICCS, Jan. 1993 (with V. Goel).
- "A Distributed Algorithm for Ear Decomposition". in the Proceedings of the 5th International Conference on Computing and Information, pp. 180-184, May 1993. (with S. Hannenhalli, K. Perumalla, R. Sridhar).
- "Efficient Algorithms for All-Pairs Shortest Path Problems on Interval, Circular-Arc, and Directed Path Graphs", in the Proceedings of the 5<sup>th</sup> International Conference on Computing and Information, pp. 31-35, May 1993. (with D.S. Joshi, R. Sridhar).
- "An Efficient Parallel Algorithm for Min-Cost Flow on Directed Series-Parallel Networks", (with A. Jain), in Proc. 7th International Parallel Processing Symposium, pp.188-192, 1993.

- “Matchings in Uniterminal Graphs”, Journal of Combinatorics, Information and System Sciences, 17, 3-4, pp.195-202, 1992.
- “On the Recognition of Strongly Chordal Graphs”, in Proceedings of the 29th Annual Allerton Conference on Communication, Control and Computing, pp. 475-483, October 1991. (with R. Sridhar)
- “Isomorphism Testing of k-trees is in NC, for Fixed k”, Information Processing Letters 34, pp. 283-287, 1990.
- “NC Algorithms for Recognizing Chordal Graphs and k-Trees”, IEEE Transactions on Computers, vol.37, No.10, pp.1178-1183, Oct. 1988. (with S.S. Iyengar).
- “Recognition and Top-Down Generation of Beta-acyclic Database Schemes”, Lecture Notes in Computer Science, Springer-Verlag, 181, pp.344-366, 1984.
- “Algorithms for Computing the Chromatic Polynomial”, Journal of Combinatorial Mathematics and Combinatorial Computing, 4, pp.213-222, 1988. (with D.R.Shier).
- “Maximal Clique Separators of Chordal Graphs”, Congressus Numerantium, vol.62, pp.203-215, May 1988, (with R. Laskar and S.S. Iyengar).
- “Chromatic Polynomials of Chordal Graphs”, Congressus Numerantium, vol.61, pp.133-142, May 1988. (with R. Laskar and C.E. Veni Madhavan).
- “On the Complexity of the Minimum Vocabulary Problem”, Journal of the American Society for Information Science, 38, 4, pp.234-238, 1988.
- “A Denotational Semantics for the Generalized Entity-Relationship model and a simple Entity-Relationship Algebra”, International Journal of Computer Mathematics, 24, pp.99-114, 1988.
- “Fast Parallel Algorithms for Tree Decomposing and Parsing Partial k-Trees”, in Proc. 26th Annual Allerton Conference on Communication, Control and Computing, Urbana-Champaign, Illinois, pp. 283-292. 1988 (with S.T. Hedetniemi).
- “Fractional Domination in Graphs”, in Proc. Seventh Hungarian Colloquium on Combinatorics, Finite and Infinite Fields, Eger, Hungary, 1987. (with S.T. Hedetniemi, R. Laskar, and A. Majumdar).

### **Books and Manuscripts**

- Object-Oriented Data Structures Featuring C++, ( with R. Sridhar, and Lee Wise), Amazon publishing, 2013.
- Object-Oriented Data Structures Featuring Java, (with R. Sridhar, and Lee Wise), (manuscript), 2006

### **Research with Students**

I supervised the M.S. Thesis work of 9 students at University of Central Florida. At Loyola, I have supervised the work of 59 undergraduate and graduate students on independent study and programming projects from 1993 to 2010. The following is a partial list of student projects.

### **Representative List of Student Projects:**

- Maria Kutwal, “Concurrent DOS and Digital Dining”, 1994
- Lei Zhu “Airline Reservation System”, (1995)
- Runqing Du, “ObjectPAL: Object-oriented Paradox Application Language”, 1995

- Padmapriya Dubasi, “Computing Chromatic polynomials”, 2009
- Malathi Kotla, “Graduate School Admission System”, 1996.
- Kalpana Reddy, “Phone Order System Design”, 1996.
- Ming Yang, “Internet Phone”, 1997..
- Xuejun Lin, “San Juan Sailboat Charters Database”, 1998.
- JinYuan Peng, “Car Insurance Project using Oracle, 2000.
- Aruna Kurella, “Student Information System”, 2000.
- Qin Jian Yu, “Electronic Submission and Records Tracking Database System”, 2003.
- Aadeel Akhtar, “Networked Based Robotic Navigation and Manipulation,”, 2007
- Horace Zhang, “Tocuh Sensor and laser Webcam based mapping and navigation, 2007.
- Piyushaben Desai, “Protocols and Algorithms for next generation digital Habitats - small module”, 2008.
- Padmapriya Dubasi, “Computing Chromatic polynomials”, 2009

### **M.S. Thesis Supervision**

- Iraklis Gerassis, “Design and implementation of parallel algorithms for the traveling salesman and for computing the chromatic polynomial”, 1993.
- Zoheir H. Ezziane, “A survey of algorithmic motion planning for robotic navigation” 1991.  
Vineet Goel, “Distributed Algorithms in Heterogeneous Networked Environments”, 1992.
- Michael Gravel, “Survey of Concurrent Object-Oriented Languages (SoCOOL)”, 1991. (committee member)
- Richard R. Dunn-Roberts, “World One, Node One, Prototyping a Virtual Reality Compiler”, 1991. (committee member).
- Bruce Koivu, “Lossless Image Compression using Linear-time algorithms: A survey”, 1992 (committee member)
- Thomas Ennis, “A survey of concurrent programming languages”, 1990. (committee member)
- David Scott Page, “A survey of Parallel Parsing algorithms for shared memory multiprocessors”, 1990.(committee member)
- Rajeev Y. Nagar, “Partitioning and Scheduling of Ada Programs for concurrent and distributed execution”, 1992 (committee member).

### **Doctoral Committee Work**

- Caroline St. Claire, "A Usefulness Metric and Its Application to Decision Tree Based Classification", DePaul University, 2000 (external committee member).
- Amit Jain, “Multiselection and multisearch: parallel algorithms” Computer Science, University of Central Florida, committee member until 1993.
- Muralidhar Medidi, “Data structures and optimal algorithms for parallel priority dequeues and parallel dictionaries”, Computer Science, University of Central Florida, (committee member until 1993)

- Thomas Wilson, “Parallel algorithms for ray tracing on a general-purpose shared-memory multiprocessor” Computer Science, University of Central Florida, 1993, (committee member).

### **Editorial & Professional Services**

- Refereed for the following organizations, conferences and journals: Algorithmica, IEEE Transactions on Computers, NSF, Discrete Applied Mathematics, Information Processing Letters, IEEE Symposium on Parallel and Distributed Computing, International Parallel Processing Symposium, International Conference on Parallel Processing, and Foundations of Software Technology and Theoretical Computer Science.
- Program Committee Member: EduHPC -- Workshop on Education for High-Performance Computing, 2013, 2014.
- Program Committee Member: EduHPDC -- Workshop on Parallel, Distributed, and High-Performance Computing in Undergraduate Curricula, 2013, 2014
- Session Chair – IEEE Computing and Communication Conference, Jan. 2017.
- Reviewer for the VLDB (Very Large Data Bases) journal, Springer-Verlag, 2015.

### **Invited Talks and Conference Presentations**

- Presentations/invited talks at various conferences and academic institutions (e.g., University of Toronto, Wayne State, Washington State University, University of New Hampshire, University of Bordeaux, Indian Institute of Technology, Indian Institute of Science) on parallel processing, networking, and combinatorial optimization.

### **Membership in Professional Organizations**

- Association of Computing Machinery
- Institute of Electrical and Electronic Engineers
- Council of Fellows of the American Council on Education.