Dr. SUKHAMAY KUNDU

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Louisiana State University, Baton Rouge, LA 70803, USA
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RESEARCH INTERESTS

Software engineering; Graph and combinatorial algorithms; Machine learning and Data mining.

EDUCATION

Ph.D.	Math.	University of California, Berkeley	1971
M.S.	Probability & Statistics	Indian Statistical Inst., Calcutta (rank: 1st Class 1st)	1967
B.S.	Math. (Hons.)	Burdwan University, W.Bengal, India (rank: 1st Class 2nd)	1965

FULBRIGHT AWARD

- Fulbright award for Lecturing in Sofwtare Engineering and Networking (Indian Institute of technology, Kharagpur), 2004.
- Fulbright award for Lecturing in Artificial Intelligence (Indian Institute of Management, Kolkata and Indian Institute of Statistics, Kolkata), 1994.

NATO ADVANCED STUDY INSTITUTE

Lectured on Fuzzy Sets at the ASI meeting on Computational Intelligence, 1996.

ACM NATIONAL LECTURER

ACM National Lecturer for 1988-1990 in Artificial Intelligence.

TEACHING EXCELLENCE AWARD

Graduate teaching-excellence award in the College of Basic Sciences, Louisiana State University, 1992.

INNOVATIVE-TEACHING AWARD

Service-Learning Faculty Scholar award, Louisiana State University, 2009.
Innovation-in-teaching award, Louisiana State University, 1995.

ADJUNCT FACULTY POSITIONS AT LSU

Electrical and Computer Enginering Dept., Fall-2002 to Fall-2004.

POSITIONS HELD

1984-present
: Associate Prof. of Computer Science, Louisiana State University, Baton Rouge. Teaching and Research in Software Engineering, Algorithms, Fuzzy Sets, Neural nets and soft computing, Artificial Intelligence, Machine Learning, Database Principles, Theory of Computation, Distributed Computing, Robotics. Supervision of PhD Dissertation Research, and MS Thesis and Projects.

Sprg. 10-12
: Visiting faculty at JIS College of Engineering, Kolkata, India. Offered several 2-week intensive course on Distributed Computing, Java programming, and C programminge.

Sprg. 10-12
: Visiting Professor at Indian Institute of Technology at Patna, India. Offered 3-day Robotics workshop (2012), Offered a 2-week intensive course on Database (2011). Offered a 2-week intensive course on Software Engineering (2010).

Sprg. 08
: Visiting faculty at Mararishi University of Management, Iowa, USA. Offered 2-week intensive course on Algorithm Design and Analysis.

Sum. 06
: Visiting faculty at University of West Indies, Jamaica. Offered 4-week course on Database.

Sum. 05
: Visiting faculty at University of West Indies, Jamaica Offered 4-week course on Database.

Sum. 01
: Visiting Professor at Kyungpook National University, Korea.

Sum. 93
: US Army Summer Visiting Research Faculty at Belvoir Research, Development & Engineering Center, Ft. Belvoir. Research in neural-nets.

Sum. 92 Visiting Research Faculty, University of Waikato, New Zealand. Research in machine learning.

Sum. 89 Taught Principles of Data Organization for IBM employees in IBM's University Level Computer Science Curriculum Program.

Sum. 88 Taught Database Principles course for IBM employees in IBM's University Level Computer Science Curriculum Program.

Sum. 87 Taught Artificial Intelligence course for EXXON research staff.

Also taught the database course for IBM in Fall 87, Sum.'86. Taught Operating System course for IBM in Sum. '84.

Sum. 85 Visiting Associate Prof., Dipartimento di Informatica, Universita di Torino, Italy. Research in database program conversion.

Sum. 84 Visiting Associate Prof., Dipartimento di Informatica, Universita di Torino, Italy. Research in database program conversion.

1981-84 Associate Prof. of Computer Science, University of Florida, Gainesville. Research in Software engineering and database. Taught Database Principles, Software Engineering, Theory of Computation, Data structures, and Discrete Mathematics. Supervised dissertation research.

Sum. 83 Guest Research Scientist, Siemens AG, Munich, W. Germany. Research in development and evaluation of a novel architecture for database machines. Design of prototype algorithms for database processing. One patent application made by Siemens.

Taught Operating System Principles course for IBM employees in IBM's University Level Computer Science Curriculum Program.

Sum. 82 Visiting Faculty Research Member, IBM, Boca Raton. Research in high level VLSI language design. Developed language concepts for parallel and asynchronous VLSI operations, hardware mapping algorithms for the software concepts and a special microcode control structures for parallel operations. Three patent applications made by IBM.

1979-81 Member of Technical Staff, Bell Laboratories, Murray Hill. Developed performance measurements and benchmark programs for CPU, I/O, and UNIX system performance. Designed tools for statistical analysis of performance data. Developed user level commands for workload generation.

Guest Lecturer in Mathematics, Fairley Dickinson University. Taught Operations Research Techniques.

1975-79 Member of Technical Staff, Logicon, Inc., Los Angeles. Supervised Automatic Test System Specification project for U.S. Air Force. Developed software test tools for the automated program verification system AMPIC. The research in testing methods have appeared in "Software Testing - Vol. I, II: State-of-the-art Report," publ. by Infotech, UK.

Conducted performance enhancement study of En Route Air Traffic Control System for NAFEC involving redistribution of I/O channel loading, management of system recovery data, and storage mapping function.

Performed design analysis of multi-computer Joint Air Surveillance System (JSS) of the U.S. Air Force regarding task management, system confidence check, and real time operating constraints.

1973-75 Assistant Prof. of Computer Science, University of Texas, Austin. Taught courses in System Modeling, Graph Theory, Theory of Languages and Automata, Data Structure, and Discrete Mathematics. Supervised dissertation research.

1972-73 Post Doctoral Research Fellow, IBM T. J. Watson Research Center, Yorktown Heights. Research in design of reliable communication networks using graph theoretic methods, and performance analysis of distributed computer networks.

JOURNAL PUBLICATIONS (most recent first)

51. Conflating two polygonal lines, *Pattern Recognition, 39(2006), pp. 363-372.*
50. The normal form of a granular fuzzy function, *Fuzzy Sets and Systems,* 124(2001), pp. 97-107.

49. Fitting a least square piecewise linear continuous curve in two dimensions (with V. Ubhaya), *Intern. J. of Computer and Mathematics with Applications,* 41(2001), pp. 1032-1041.

48. An optimal $O(N^2)$ algorithm for computing min-transitive closure, *Info. Processing Letters,* 74(2000), pp. 215-220.

47. Learning rules from numerical data combining geometric and graph theoretic approach (with J. Chen), *Intern. J. of Robotics and Autonomous Systems,* 33(2000), pp. 135-147.

46. A better fitness measure of a text-document for a given set of keywords, *Pattern Recognition,* 32(2000), pp. 841-848.

45. Similarity relations, fuzzy linear orders, and fuzzy partial orders, *Fuzzy Sets and Systems* 109(2000), pp. 419-428.

44. A representation theorem for arbitrary min-transitive fuzzy relations, *Fuzzy Sets and Systems* 109 (2000), pp. 453-457.

43. Gravitational clustering: a new approach based on spatial distribution of points, *Pattern Recognition,* 32 (1999), pp. 1149-1160.

42. Membership functions for a fuzzy group from similarity relations, *Fuzzy Sets and Systems, 101(1999), pp. 391-402.*

41. A solution to histogram-equalization and other related problems by shortest path method, *Pattern Recognition*, 31(1998), pp. 231-234.

40. What's in a fuzzy membership value, *NATO ASI on Computational Intelligence* (eds. Kaynak, et al.), Springer-Verlag, New York, pp. 114-127, 1998.

39. The correct form of a recent result on level-subgroups of a fuzzy group, *Fuzzy Sets and Systems,* 97(1998), pp. 261-263.

38. Preference relation on fuzzy utilities based on fuzzy leftness relation on intervals, *Fuzzy Sets and Systems*, 97(1998), pp. 183-191.

37. Fuzzy logic or Lukasiewicz's logic: a clarification (with J. Chen), *Fuzzy Sets and Systems*, 95(1998), pp. 369-379.

36. The min-max composition rule and its superiority over the usual max-min composition rule, *Fuzzy Sets and Systems,* 93(1998), pp. 319-329.

35. Calibration of a constitutive model using genetic algorithm (with S. Pal and G.W. Wathugala), *Computers and Geotechnics,* 19 (1996), pp. 325-348.

34. Min-transitivity of fuzzy leftness relationship and its application to decision making, *Fuzzy Sets and Systems*, 86(1997), pp. 357-367.

33. Defining the fuzzy spatial relationship Left(A, B): issues and solutions, *Fuzzy Sets and Systems,* (to appear).

32. A new class of theories for which circumscription can be obtained by predicate completion (with J. Chen), *J. of Experimental and Theoretical Artificial Intelligence,* 8(1996), pp. 191-205.

31. The strong semantics for logic programs (with J. Chen), *J. of Intelligent Information Systems,* 5(1995), pp. 51-68.

30. A new method of circumscribing beliefs: the propositional case (with J. Chen), *Fundamenta Informaticae*, 1994.

29. An optimal O(n) algorithm for determining the subregion-tree representation of a rectangular dissection, *SIAM J. of Computing*, 27(1993), pp. 79-101.

28. The minimal strings in a regular language with respect to a partial order on the alphabet, *Journal of Theoretical Computer Science*, 83(1991), pp. 287-300.

27. A new variant of A*-algorithm which closes a node at most once, *Annals of Mathematics and Artificial Intelligence (AMAI)*, 4(1991), pp. 157-176.

26. An O(k.N.log N) algorithm for decomposing a set of polygons into D-separable components (with R. Sridhar), *Pattern Recognition,* 23(1990), pp. 735-744.

25. Deadlock free buffer allocation in closed queuing networks (with I. F. Akyildiz), *Queuing Systems,* 4(1989), pp. 47-56.

24. The equivalence of the subregion representation and the wall representation for a certain class of rectangular dissections, *Commu. of ACM*, 31(1988), pp. 752-763.
23. A new O(n.log n) algorithm for computing intersection of convex polygons, *Pattern Recognition*, 20(1987), pp. 419-424.
22. The call-return tree and its application to program performance measurement, *IEEE Trans. on Software Engineering*, SE-12(1986), pp. 1096-1098.
21. Modeling the CODASYL DML context dependency for database program conversion, *Information Systems*, 11(1986), pp. 87-100. (jointly with B. Demo)
20. Reconstruction of a pair of graphs from their concatenations, *SIAM J. Algebraic and Discrete Methods*, 1(1980), pp. 180-183.
19. A Dijkstra-like shortest path algorithm for certain cases of negative arc lengths, *BIT*, 20(1980), pp. 522-524.
18. SETAR - a new approach to test case generation, *Software Testing: INFOTECH State-of-the-Art Report (invited papers)*, Vol. 2 (1979), pp. 161-187.
17. Note on a constrained path problem in program testing, *IEEE Trans. on Software Engineering*, SE-4(1978), pp. 75-76.
16. An intermediate value theorem for optimum tree valuation, *Information Process. Letters*, 8(1978), pp. 141-145.
15. The Chartrand-Schuster conjecture: graphs with unique distance tree are regular, *J. of Combinatorial Theory (B)*, 22(1977), pp. 233-245.
14. A linear algorithm for partitioning a tree, *SIAM J. of Computing*, 6(1977), pp. 151-154. (jointly with J. Misra)
13. Sorting tree, nesting tree, and inverse permutation, *Information Process. Letters*, 7(1977), pp. 94-96.
12. Reconstruction of a tree from its homomorphic images and other related transforms, *J. of Combinatorial Theory (B)*, 20(1976), pp. 117-123.
11. A linear algorithm for Hamiltonian completion number of a tree, *Information Process. Letters*, 5(1976), pp. 55-57.
10. Disjoint representation of three tree realizable sequences, *SIAM J. of Appl. Math.*, 28(1975), pp. 290-302.
9. Existence of a graph with three edge disjoint spanning trees and given degree sequences, *SIAM J. of Computing*, 3(1974), pp. 296-298.
8. Factorization of a certain class of graphs, *Discrete Math.*, 8(1974), pp. 41-47.
7. Bounds on the number of disjoint spanning trees, *J. of Combinatorial Theory (B)*, 17(1974), pp. 199-203.
6. Generalizations of the k-factor theorem, *Discrete Math.*, 9(1974), pp. 173-179.
5. Disjoint realization of tree realizable sequences, *SIAM J. of Appl. Math.*, 26(1974), pp. 103-107.
4. The k-factor conjecture is true, *Discrete Math.*, 6(1973), pp. 367-376.
3. A matroid generalization of a theorem of Mendelsohn and Dulmage, *Discrete Math.*, 4(1973), pp. 159-163. (jointly with E. L. Lawler)
2. A graphical realization problem, in *Lecture notes in Mathematics* #406, Graphs and Combinatorics, Springer-Verlag, New York, 1973, pp. 314-318.
1. On higher powers of graph, *Sankhya (A)*, 39(1969), pp. 487-492.

PAPERS AT PROFESSIONAL REFEREED CONFERENCES (most recent first)

78. Improving Undergraduate Students' Programming Skills, *Proc. Intern. Conf. Software Engineering Advances (ICSEA)*, Portugal, Nov. 18-23, 2012.
77. Optimal information organization for web and other displays. *Proc. of IEEE World Congress in Information and Communication Technology (WICT-11)*, Mumbai, Dec 11-13, 2011.
76. Approximation of CFL by Regular Languages for Concurrent Program Verification (with S. Mukhopadhaya) *Proc. 34th Annual IEEE Intern. Computer Software and Applications Conference (COMPSAC-10)*, Korea, July 19-23, 2010.

75. Service-Learning and Active-Learning: an experience based comparison, *Proc. Intern. Conf. on Frontiers in Education Computer Science and Computer Engineering (FECS-10),* Las Vegas, July 12-15, 2010.

74. Shape recognition using a new spatial representation and a D.P. matching algorithm (with S. Gu), *Proc. Intern. Conf. on Advances in Pattern Recognition (ICAPR-09),* Indian Statistical Institute, Kolkata, Feb 4-6, 2009.

73. Content-model based course-design for active learning, critical thinking, and creativity, *Proc. Intern. Conf. on Frontiers in Education Computer Science and Computer Engineering (FECS-09),* Las Vegas, July 13-16, 2009.

72. A distributed $O(|E|)$ algorithm for optimal link-reversal, *Intern. Conf. Distributed Computing and Networking ICDCN-09*, Jan 3-6, 2009, pp. 243-250.

71. EasyMAC: a new and simple protocol for slot assignment for media access in sensor networks, *ISCA 21 Intern. Conf. on Parallel and Distributed Computing and Communication Systems*, New Orleans, 2008, pp. 141-146. (with J. Brees)

70. Finding shortest multipaths with $O(N^{2})$ message complexity, *ISCA 21 Intern. Conf. on Parallel and Distributed Computing and Communication Systems*, New Orleans, 2008, pp.1-6. (with J. Brees)

69. Orthogonal Decomposition of Finite-State Behavior Models As a Basis for Determining Components in Software Architectures, *Proc. Intern. Conf. on Software Engineering Theory and Practice (SETP-08),* Orlando, Florida, July 7-10, 2008.

68. Teaching software modeling and design based on relevant science of software design and science of learning, *Proc. Intern. Conf. on Frontiers in Education Computer Science and Computer Engineering (FECS-08),* Las Vegas, July 14-17, 2008.

67. Structuring software functional requirements for automated design and verification, *Proc. 31st Annual IEEE Intern. Computer Software and Applications Conference (COMPSAC-07),* Beijing, 24-27 Jul, 2007, pp. 127-134. (nominated for best-paper award).

66. Using data-integrity constraints in model-based design, *Proc. 16th Intern. Conf. on Software Engineering and Data Engineering (SEDE-07),* Las Vegas, July 9-11, 2007, pp. 288-295. (nominated for best-paper award).

65. (with G. Nigel) A software tool for optimal class-hierarchy design based on the use-relationship among functions and variables, *4th Intern. Conf. on Information Technology : New Generations (ITNG 2007), Las Vegas (USA), April 2-4, 2007, pp. 326-331.*

64. (with D. Datta) Reliable and efficient data transfer in wireless sensor networks via out-of-sequence forwarding and delayed request for missing packets, *4th Intern. Conf. on Information Technology : New Generations (ITNG 2007), Las Vegas (USA), April 2-4, 2007, pp. 128-133 (received best-paper award).*

63. A canonical shape representation for a polygon, *Proc. Intern. Conf. on Advances in Pattern Recognition*, Indian Statistical Institute, Kolkata, 2006.

62. Deadlock-free distributed relaxed mutual exclusion without revoke messages, *The 7th International Workshop on Distributed Computing,* Kharagpur, India, Dec 23-27, 2005, pp. 463-474.

61. A formal approach to designing a class-subclass structure using a partial order on the functions, *The 29th Annual Intern. Computer Software & Applications Conf., COMPSAC-05*, Edinburgh, Scotland, Jul 26-28, 2005, pp. 213-220.

60. A new analysis of dataflow diagrams for functional and object-oriented design, *The IASTED Intern. Conf. on Software Engineering, SE-2005,* Austria, Feb. 15-17.

59. Normalized dataflow diagrams: a sound basis for Software design, *Proc. 4th, Intern. Conf. Computer Sc., Soft. Engineering, Information Tech., e-Business and Applications,* Egypt, Dec 27-29, 2004.

58. A modern graphic flowchart layout tool, *Proc. 1st Intern. Conf. on Distributed Computing and Internet technology, ICDCIT-04*, India, Dec 22-24.

57. Modeling complex systems by a set of interacting finite-state machines, *Proc. 10th Asia Pacific Software Engineering Conf, APSEC-2003*, pp. 380-389, Thailand, Dec 10-12, 2003.

56. Optimal converter placement in tree-networks, *Proc. 15th Intern. Conf. on Parallel and Distributed Computing Systems, PDCS-2002,* pp. 337-342, 2002, Louiville, USA.

55. Finite state modeling in software design: some fundamental techniques, *Proc. 9th Asia Pacific Software Engineering Conf, APSEC-2002,* Queensland, Australia, Dec 4-6, 2002.

54. A canonical functional design based on the domination-relationship among data, *Proc. 8th Asia Pacific Software Engineering Conference, APSEC-2001*, Macau, Dec 4-7, 2001.

53. The concept of path-closed sets and its application in software functional design, *Proc. of 7th Asia-Pacific Software Engg. Conference, APSEC-2000*, Singapore, Dec 5-8, 2000, pp.112-119.

52. Replacing trapezoidal membership functions by triangular membership functions for ⊗-transitivity, *Proc. NAFIPS-99*, New York, June 9-12, 1999.

51. Learning rules from numerical data by combining geometric and graph theoretic approach, *2nd Intern. Symp. on Intelligent Manufacturing Systems, IMS-98*, Sakaraya, Turkey, 1998, pp. 23-31.

50. Similarity relations, fuzzy linear orders, and fuzzy partial orders, *NAFIPS-97*, Syracuse, NY, Sept. 21-24, 1997.

49. Design of heuristic fuzzy controller (with J. Chen), *Proc. 5th Intern. Conf on Fuzzy Systems, FUZZ-IEEE-96*, New Orleans, Sept. 8-11, 1996.

48. What's in a membership value: issues and solutions, *NATO Advanced Study Institute in Soft Computing, Antalya, Turkey, Aug 21-31, 1996.*

47. Preference relation on fuzzy utilities based on fuzzy leftness relation on intervals, *Proc. 6th Intern. Conf. on Industrial Fuzzy Control and Intelligent Systems, ISAI/IFIS-96*, Cancun, Mexico, Nov. 12-15, 1996.

46. Fuzzy control system design by fuzzy clustering and self-organization (with J., Chen), *Biennial Conf. of North Amer. Fuzzy Info. Proc. Soc., NAFIPS-96*, Berkeley, 1996.

45. A sound and complete fuzzy logic system using Zadeh's implication operator, *Proc. of Intern. Symposium on Methodologies for Intelligent Systems, ISMIS-96*, Poland, 1996.

44. Membership functions for a fuzzy group from similarity relations, *Proc. of 2nd Annual Joint Conference on Information Sciences, JCIS-95*, North Carolina, Sept. 28-Oct. 1, 1995.

43. Min-transitivity of fuzzy leftness relationship and its application to decision making, *Proc. of Intern. Joint Conf. of CFSA/IFIS/SOFT-95 on Fuzzy Theory and Applications*, Taipei, Taiwan, Dec 6-9, 1995.

42. An improved method for fuzzy inferencing using Zadeh's implication operator, *Proc. Intern. Joint Conf. on Artificial Intelligence, IJCAI-95* (Fuzzy logic workshop), Montreal, 1995.

41. Defining the fuzzy spatial relationship Left(A, B), *Proc. Intern. Conf. on Fuzzy sets and Applications, IFSA-95*, Brazil, Jul 22-28, 1995.

40. The min-max composition rule and its superiority over the usual max-min composition rule, *Proc. of Florida AI Research Symposium, FLAIRS-95*, Melbourne Beach, FL, April 27-29, 1995.

39. Fuzzy linear invariant clustering with applications in fuzzy control, *Proceedings of NAFIPS/IFIS/NASA-94*, San Antonio, TX, Dec. 1994, pp. 196-200.

38. Problems with the defuzzification method and a solution using Lukasiewicz's logic: Part 1, *Proceedings of 3rd International Conf. on Fuzzy Theory & Technology, FT&T-94*, Pinehurst, NC, Nov. 14-16, 1994.

37. Fuzzy logic or Lukasiewicz's logic: a clarification, *Proceedings of 8th International Symp. on Methodologies for Intelligent Systems, ISMIS-94*, Charlotte, NC, Oct. 17-19, 1994.

36. The Complementation Principle: a technique for discovering new concepts in inductive learning, *Proceedings of Florida AI Research Symposium, FLAIR-94*, Pensacola Beach, Florida, May 5-7, 1994.

35. Discovering new concepts in rule learning by local generalization (with C.-L. Tseng), *Proceedings of 6th International Symp. on Artificial Intelligence*, Sept. 21-24, 1993, Monterrey, MEXICO.

34. Absorption by decomposition: a more powerful form of absorption, *Proceedings of 6th International Symp. on Artificial Intelligence*, Sept. 21-24, 1993, Monterrey, MEXICO.

33. A new method of circumscribing beliefs: the propositional case (with J. Chen), *Proceedings of Pacific Rim International Conference on Artificial Intelligence*, PRICAI-92, Korea, 1992.

32. A new non-decision tree approach to learning classification rules from examples, *Proceedings of Pacific Rim International Conference on Artificial Intelligence*, PRICAI-92, Korea, 1992.

31. Inductive learning of rules by combining explanation-based learning and rule-coverage (with P. Langley), *International Sympo. on Artificial Intelligence*, ISAI-92, Cancun, Mexico, 1992.

30. Representation of fuzzy sets as monotone probability distributions and derivation of the rules for fuzzy operations, *2nd Intern. Symposium on Artificial Intelligence and Mathematics*, Jan 4-6, 1992, Fort Lauderdale, FL.

29. A new logic of belief - monotonic and non-monotonic belief: Part I, *Proceedings of 12th International Joint Conference on Artificial Intelligence*, IJCAI-91, 1991, Sydney, Australia (1991), 24-28 Aug.

28. A stronger declarative semantics for disjunctive normal programs using their normal forms (with J. Chen), *6th International Symposium on Methodologies for Intelligent Systems* (ISMIS), pp. 490-499, Charlotte, NC (1991), Oct. 17-19.

27. A new class of theories for which the circumscription can be obtained via predicate completion (with J. Chen), *Proceedings of Pacific Rim International Conference on Artificial Intelligence, PRICAI-90*, Nov. 14-16, 1990, Nagoya (JAPAN).

26. The minimal strings in a regular language with respect to a partial order on the alphabet, *Proceedings of The 28th Allerton Conference on Communication, Control, and Computing*, Oct. 3-5, 1990, Montecello, Illinois.

25. A new and simple method for explicit computation of a circumscription (with J. Chen), *14th German workshop on Artificial Intelligence (GWAI-90)*, Geseke, W. Germany, Sept. 10-14, 1990. (A short version appears in proceedings of *International Symposium on Methodologies for Intelligent Systems (ISMIS-90)*, Knoxville, Tenn, USA, Oct. 25-27, 1990.)

24. Learning a finite-state machine, *Proceedings of 8th Canadian Conference on Artificial Intelligence*, Ottawa, Canada, May. 23-25, 1990.

23. Application of A*-algorithm for optimal ancestral DNA-sequence (with A. Mukherjee), *Workshop on Application of AI*, Stanford University, March 1990.

22. Minimum non-deterministic finite-state machines, *Workshop or Algorithmic Research Methods - WARM*, Mar. 23, 1990, Austin, TX.

21. Consistency of belief-sets in Truth-Maintenance (with J. Chen), *Proc. International Symposium on Computational Intelligence*, Sept. 25-29, 1989, Milan, Italy.

20. Truth in Truth-Maintenance (with J. Chen), *Proc. International Symposium on Methodologies for Intelligent Systems*, Oct. 11-14, 1989, Charlotte, NC.

19. A new variant of A* algorithm which closes a node at most once, *Proc. International Computer Sc. Conf. on Artificial Intelligence and Applications*, Dec. 19-21, 1988, Hong Kong.

18. A corrected form of the graph-based decision algorithm for linear propositional temporal logic, *Proc. Symposium on Methodologies for Intelligent Systems*, Oct. 12-14, 1988, Torino, Italy.

17. Application of Artificial Intelligence techniques to Software Engineering problems (invited paper), *Proc. Conf. on Expert Systems Technology in ADP environment*, Washington, D.C., Nov. 2-3, 1987.

16. Rule discovery from examples using a combination of syntactic and semantic information, *International Symposium for Methodologies for Intelligent Systems*, Charlotte, NC, Oct. 13-17, 1987.

15. Spatial Reasoning in rectangular dissection, *Workshop on Spatial Reasoning and Multi-sensor Fusion*, Illinois, Oct. 5-7, 1987 (with R. Singh).

14. A new abstraction mechanism for the rectangular dissection problem in VLSI-layout and floor-plan design, *International Computer Symposium*, Taiwan, Dec. 15-19, 1986.

13. Tree structured resolution proof and the general semantic tree, *International Symposium on Methodologies for Intelligent Systems*, Knoxville, Oct 23-25, 1986.

12. A theory of multi-relations for uncertain facts, *Third Annual Symposium on Knowledge-based Systems: Theory and Applications*, Columbia, S.C., 1986.

11. An architecture for converting CODASYL operations with ambiguous interpretations, *Convention Informatique Latine*, Bercelona, Spain, 1985, pp. 476-503. (jointly with B. Demo)

10. The weak entity and its modeling power, *The 4th Intern. Conf. on Entity-Relationship Approach*, Chicago, Oct. 28-30, 1985. (paper was accepted, but could not be present to deliver the paper)

9. A method for incorporating user viewpoints in information retrieval systems, *First Intern. Fuzzy Systems Association Conf.*, Universita de Palma de Mallorca, Spain, July 1-6, 1985. (jointly with D. Kraft and T. Radecki)

8. Analysis of the context dependency of CODASYL find-statements with application to database program conversion, *ACM SIGMOD International Conference on Management of Data*, (Austin, May 1985). (jointly with B. Demo)

7. An improved algorithm for finding a key of a relation from the functional dependencies, *ACM SIGACT-SIGMOD Symposium on Principles of Database Systems*, (Oregon, Mar. 1985), pp. 189-192.
6. A database structure for studying the dynamic properties of a program, *Proc. 18th Hawaii Int. Conf. on System Science*, Jan. 2-4, 1985.
5. A basic system for decompiling CODASYL DML into relational interface, *Proc. Int. Computer Symposium*, China, 1984. (jointly with B. Demo)
4. An optimized quadtree structure for pictorial data representation, *Proc. IEEE Int. Conference on Systems, Man, and Cybernetics*, Bombay, India, 1983, pp. 771-776. (jointly with S. Iyengar)
3. Context free intersection of context free languages, *Proc. Twentieth Annual Allerton Conference on Communication, Control, and Computing*, Illinois, 1982, pp. 384-393.
2. A linear O(V) algorithm for computing transitive reduction of a planar acyclic digraph, *Proc. First Conference of Software Technology and Theoretical Computer Science*, Bangalore, India, 1981, pp. 39-48.
1. A new program analysis technique with applications to test case generation, *Proc. Third USA-JAPAN Computer Conference*, San Francisco, 1978, pp. 482-486.

OTHER SCHOLARLY ACTIVITIES

- Program Committee member in International Conference on Distributed Computing and Information Technology (Software Engineering track), Bhubaneshwar 2005, and Bhubaneshwar 2004.
- Program Committee member in Asia Pacific Software Engineering Conf, Korea 2004, Tahiland 2003, and Autralia 2002.
- Program committee member for SIGMOD Database Conference, 1995
- Associate Editor of NETWORKS, an international journal (from 1981 to 1988).
- Organizing-committee member for International Symposium on Methodologies for Intelligent Systems (ISMIS), Charlotte, NC, Oct. 17-19, 1987.
- Program Committee member in International Symposium on Methodologies for Intelligent Systems (ISMIS), Oct. 22-25, 1986, Knoxville.
- Session chair in NAFIPS-99: International Conference on North American Fuzzy Information Processing Society, New York, 1999.
- Session chair in CIKM-99: International Conference on Information and Knowledge Management, Kansas, 1999.
- Reviewer for National Science Foundation grants proposal.
- Referee for Information Science, Fuzzy sets and Systems, SIAM J. of Computing, IEEE Trans. on Software Engr., IEEE Trans. on Computers, Information and Control, J. of Combinatorial Theory, Discrete Mathematics, and Math. Reviews.
- Technical reviewer of NBS Special Publication on "Software Validation, Verification, and Tools," "Structured Testing," and "Planning for Software Validation, Verification, and Testing." U.S. Dept. of Commerce.

COURSES TAUGHT

Graduate	Undergraduate
• Algorithm Design and Analysis	• Data structure
• Software Modeling	• Software Engineering
• Networking/Distributed Computing	• Discrete Maths
• Advanced Artificial Intelligence	• Artificial Intelligence
• Database Principles	• Database systems
• Soft Computing	• Fuzzy Sets and Applications
	• Theory of Computing

GRANTS FUNDED

3. Mathematical frameworks supporting conflation problems (subcontract from Dr. B. Kovalerchuk and others at Central Washing University, WA), NIMA University Research Initiative, LSU share of the grant, $105,891

(for 3 years starting June-02).

2. Expert Systems for Legal Reasoning (subcontract from Dr. DeBessonett, Southern University), 1986, $10,000 (approx.).
1. Summer Faculty Research Grant from University Council on Research, LSU, 1985 Summer, $4,000.

OTHER RECOGNITION

4. Served on PhD Thesis committee in Computer Sc. Dept, Alakhawayn University, Morocco, 2001. (funded by Fulbright Scholarship).
3. Invited to lecture on Artificial Intelligence and Database at University of Santa Maria, Chile, 1986.
2. Invited to lecture on Artificial Intelligence at Hefei Polytechnic Institute, China, 1985.
1. Served as External Ph.D. Thesis examiner for Jadavpur University, 1986. (Thesis: A system for electronic processing and editing of Bengali and other Indian Language Texts.)

PH.D. DISSERTATION DIRECTED

- Reliable and efficient data transfer protocols in wireless sensor networks (2007).
- Optimal convertor placement in optical network (2005).
- Level of essentialness for nodes in a flowchart and its application to software testing (2003).
- Complexity and Heuristics in Rule-Based Algorithmic Music Composition (2002).
- A hierarchical shape representation by convexities and concavities and its application to shape matching (2000)
- A universal parametrization in B-spline curve and surface interpolation (1998)
- Distributed debugging using I/O automata model (1996).
- Genetic algorithm for satisfiability problem (1993)
- Automated learning of recursive rules (1993).
- FORGE: A new approach to automated learning of Prolog-like rules (1992).
- Intelligent PROLOG backtracking (1988).
- Resolution-based proof technique for temporal logic with extension to the "Until" operator (1987).

MASTERS THESIS/PROJECT DIRECTED

- Partial ordering on classical and quantum states (2011).
- A method for modifying a flowchart-display after collapsing a substructure (2003).
- Variation of flow-deviation for optimizing route allocation to satisfy a given message requirements in a network (2003)
- Visualization of graphs and trees using Motif and OpenGL (2002)
- C-Viewer: a software for visualization of C-programs based on its nested-structure (2001)
- Clustering using shortest-path method (2000)
- Prog-Comp: a software for detecting structural changes in a program (2000)
- A skelotonization algorithm using gradient of chessboard-distance (2000)
- Concept lattice generation (1999)
- PRINS: A program instrumentation software (1999)
- Extension of AUTO-SQL for complex multi-goal relation queries (1999)
- Optimal fixed-time task assignment in $O(N.\log N)$ time (1999)
- A two-steps look-ahead generalization of Fadlallah's scheduling heuristics (1999)
- A tree representation of an image and its applications (1999)
- AUTO-SQL: A tool for automatic generation of SQL-queries from English-queries(1998)

- Fuzzy techniques in rule-based composition of species-counterpoint (1998)
- Implementation of an efficient algorithm for computing spatial-join using R-trees (1998)
- EPIC: an extension of PIC and PREPIC: a preprocessor of EPIC (1998)
- Image compression by optimal selection of gray-values for quantization (1997)
- Distributed debugger based on I/O-automata (1997)
- A multi-user concurrent text editor (1996).
- An architecture for distributed debugging (1995).
- QUAC: a software tool for improved communication in a learning environment (1994).
- Learning robot's motion in a maze from examples (1993).
- An object oriented implementation of AI techniques for fault analysis in chemical processes (1992).
- Implementation of a technique for minimizing non-deterministic finite state machines (1991).
- Implementation of a resolution inference technique for belief logic (1991).
- Application of A*-search algorithm in computing an optimal ancestral DNA-sequence from a given set of derived sequences (1990).
- A new PROLOG implementation which uses past failure information to speed up the search (1990).
- A new and simplified algorithm for truth maintenance which identifies a consistent subset of formulas (1989).
- A distributed mutual exclusion algorithm in which the effort equals the responsibility (1989).
- An implementation of the new variant of A* algorithm which closes a node at most once (1988).
- An implementation of the generalized time-stamp concurrency control method in database (1988).
- Further improvements in intelligent backtracking and forward jumping for fast PROLOG execution (1988).
- An implementation of the corrected satisfiability-graph method.
- Rule-discovery from examples of two dimensional scenes (1987).
- Approximate construction of the structure tree T(D) for a T*-plan D from its horizontal relationships for spatial inferencing (1987).
- An intelligent legal database (1987).
- An expert system for architectural floor-plan design (1987).
- An expert system for understanding formal definitions and automatic generation of examples (1987).
- A graphics tool for creating scenes of several objects with spatial relationships (1986).
- A natural language parser for simple English compositions with prepositional phrases and conjunctions (1986).
- An expert system for undergraduate student advising (1986).
- A theorem prover with multiple proof strategies and with a capability for new hypothesis formation (1986).
- An expert system for generating relational queries from CODASYL database application program (1986).
- GIDAS - a graphics display system for detecting redundant inequalities (1985).
- Incorporation of historical information in databases: an implementation on INGRES (1985).
- A software package for generating a hierarchical database schema from a PASCAL program (1985).
- Conversion of a network schema to a hierarchical schema with minimization of data redundancy (1984).

NEW COURSES INTRODUCED AND TAUGHT

- Advanced Computer Networks (CSC-7501)
- Advanced Artificial Intelligence (CSC-7444)
- Advanced Database (CSC-7402)
- Soft Computing (CSC-7446)
- Fuzzy Sets and Application (CSC-4446)

- Software Modeling (CSC-7700)

UNIVERSITY COMMITTEES SERVED

- Member of Faculty Senate Committee for Student Aid & Scholarship.
- Member of Faculty Senate Committee for evaluation of Chancellor Emmert.
- Member of Faculty Senate Committee for Evening-School-Faculty-Advising.
- Member of Faculty Senate Committee for Course-and-Curriculum.
- Member of Faculty Senate Committee for Faculty-Personnel-Policies.
- Representative of Graduate School for PhD committees (in Electrical Enginering, Chemical Enginering, Mathematics, Industrial Enginering, etc; more than 10).

SERVICE TO COMMUNITY

- Paul Harris fellow of The Rotary Foundation of Rotary International (for the work done in connection with establishing an eye-care center in Wes Bengal, India through Rotary Foundation of Rotary International).
- Member of "Friends of Hem Sheela Model School" (for the work done in establishing student scholarship funds at Hem Sheela Model School, Wes Bengal, India).
- Established a scholarship fund at the school run by Tomorrow's Foundation (Calcutta, India), working with ASHA, an US based organization to promote educational opportunities for under-privileged children in India.
- Raised funds for Bustee Welfare Center, Calcutta to support a school for underprivileged children (work done through ASHA).
- Founding member and member of the Executive committee of Baton Rouge Bengali Association (a social/cultural/religious organization of Bengali Community in Baton Rouge).
- Raised funds for Ramakrishna Mission to set up student scholarships at Narendrapur Ramakrishna Mission High School, West Bengal.
- Volunteer worker at Mother Teresa Soup Kitchen, Baton Rouge.
- Bought an used car to help a family through Catholic Community Services in Baton Rouge.

SERVICE TO THE DEPARTMENT

- Invited many ACM National speakers for departmental seminars; also invited seminar speakers from Lafayette and Tulane to develop academic cooperation among these campuses.
- Initiated an undergraduate concentration area in software engineering (with help from other faculty members from the dept).
- See earlier NEW COURSES INTRODUCED (four new grad. courses introduced and taught); also, introduced a grad course on Datamining (with J. Chen).
- Served on graduate and undergrad curriculum committee.
- Served on faculty hiring committees.
- Served on admission and assistantship committees.
- Chair of the subcommittee for PhD General exam in AI.
- Member of the subcommittees for Ph.D. general exam in Algorithms and Theory areas.
- Member of Master's Comprehensive Examination committee.
- Serve on Ph.D. and M.S. examination committees.