

Research Focus in Department

Having obtained Ph.D. from I.I.T., Delhi, my focus was widened to development of research environment in the department. My suggestion to introduce a research-oriented M. Sc. Computer Science programme received wholehearted support from colleagues at the department as well as authorities. At a time when the department was finding it hard to attract good Ph. D. students, it gave much-needed boost to research in the department.

A small lab space was made available for the exclusive use of research students. By reorganizing the space, we could allocate independent offices to colleagues in the department.

Initiated a base paper for Ph.D. ordinance suggesting the need to reorganize the Board of Research Studies into smaller boards to better address the faculty specific requirements, the examiners for Ph.D. dissertations to be appointed by the departmental research committees, instead of Committee of Courses, synopsis to be asked for six months before Ph.D. submission rather than at the point of registration.

Research Work

My focus in research is on application of genetic algorithms for problems in social networks, robot coalition formation, and design of associative classifiers. More precisely, we are studying the parallel implementation of these algorithms in CUDA framework. Prior to this, one of my students completed her thesis on fuzzy subspace clustering.

Initiatives as Head of Department (Oct 2002- Sept 2005)

- To bring the academic calendar and declaration of results on schedule.
- Successfully proposed online subscriptions for ACM, IEEE, and LNCS.

Teaching

I have taught a varied array of courses in Master of Computer Applications and M.Sc. Computer Science programmes including Programming Fundamentals, Compiler Design, Automata Theory, Data Structures, Systems Programming, Database Management Systems, and Computational Intelligence.

Curriculum Development at University Level

Actively participated in curriculum development for M.C.A., M.Sc. Computer Science, and undergraduate computer science programmes.

Curriculum Development at School Level

Have been member of Committee of courses for the CBSE.

- Recently, coordinated a workshop on Python Programming for school teachers.
- Co-author for the book “Computer Science Concepts” for class 12 students.
- Convener for the book “Data Management Applications”, for class 12 students, being published by CBSE.

Extension Services

- Faculty advisor for Delhi University Computer Science Society.
- Garnered support from friends and alumni to create a book bank and provide laptops for economically weak students.
- Participated as a resource person in faculty development programmes (including refresher courses) for the teachers.
- Have been on the programme committee/organizing committee of International Conference- Confluence - The Next Generation Information Technology Summit, International Conference on Big Data Analytics (BDA), IBM-Collaborative Academia Research Exchange (I-CARE), World Conference on Nature and Biologically Inspired Computing (NaBIC), International Conference on Management of Data (COMAD), International Database Engineering and Applications Symposium (IDEAS), VLDB Database Workshop.

Placement Work

I have been actively associated with the placement Cell for MCA/M.Sc. students at the department. I also coordinated the placement of BIT/BIS students.

Faculty Selection

Participated in several selection committees in colleges of the University.

Purchase Committee

In addition to participating in purchase committees, in early eighties, successfully convinced the committee to procure a licensed copy of UNIX.

Awards and Scholarships

I have been a recipient of National Science Search Talent Scholarship and M. Tech. Scholarship, apart from being recipient of merit scholarship at primary and middle school stage.

UNIVERSITY OF DELHI

PERFORMA FOR SELF-ASSESSMENT

Section I

1. Name: Naveen Kumar
2. Designation: Associate Professor
3. Date of Birth: 08-08-1959
4. Academic Qualification: Ph.D.
5. Date of Joining the University: 23 July 1984
6. Date of Confirmation: 23 July 1984
7. Teaching Experience:

Name of Institution	Position held with Pay Scale	Ad-hoc/ Temporary/ Permanent	From	To	Total Experience		
					Years	Months	Days
University of Delhi	Ad-hoc	Ad-hoc	7/09/1983	30/04/1984	0	7	24
University of Delhi	Lecturer	Permanent	23/07/84	26/11/91	7	4	4
University of Delhi	Lecturer (Senior Scale)	Permanent	27/11/91	26/07/98	6	8	0
University of Delhi	Lecturer (Reader Scale)	Permanent	27/07/98	10/02/99	0	6	15
University of Delhi	Reader	Permanent	11/02/99	31/12/05	6	10	21
University of Delhi	Associate Professor	Permanent	01/01/06	date	8	5	12

(In case of Ad-hoc, Temporary experience, please enclose experience certificate)

8. Courses taught at various levels (Name the courses giving details):

a) Undergraduate: NIL

b) Post-graduate:

Master of Computer Applications:

Programming Fundamentals, Compiler Design, Automata Theory , Data Structures, Systems Programming, Database Management Systems

MSc (Computer Science):

Computational Intelligence, Data Mining, Compiler Design

9. Courses taught during the last three years (Give Exact Details):

	1 st Year	2 nd Year	3 rd Year
a) Undergraduate:			
b) Post-graduate:	MSc: Compiler Design MSc: Computational Intelligence MSc: Data Mining	MCA: Compiler Design MCA: Automata Theory	

10. Details of sources materials consulted by you the courses taught (books, journals etc.):

Please see Annexure A.

11. Details of teaching methods employed by you (Lectures, Tutorials, Seminars, Practical etc.):

Class room lectures are supported by slides. Open source slides are freely used, giving due credit to the author. The online video content is also used to supplement teaching. Students are encouraged to enroll for related online courses. Students are asked to read an article and related content, and to rewrite the article in their own words and make a presentation. 3-4 assignments are given in a semester, and each is evaluated over a period of 10-12 hours, spread over 2-3 days.

12. Details of the tutorials during the last academic year:

	Under-Graduate	Post-Graduate
Number Held:		As mentioned in 11
Assignments Checked:		As mentioned in 11

13. Were you able to meet the classes alloed to you during the last academic year in any of the levels of regularity given below (circle what is applicable):

- a) 90% to 100% b) 80% to 90% c) 70% to 80% d) below 70%

Section II

1. Give Details of the following degrees

	University	Year of Award	Topic of Dissertation/Subject
Ph.D.	IIT Delhi	1999	Invariance in Computer Vision
M. Tech.	IIT Delhi	1983	Computer Science
M. Sc.	IIT Delhi	1981	Mathematics
B.Sc. (Honours)	University of Delhi	1979	Mathematics

2. Details of thesis, if published (a copy may be enclosed): NIL

a) Area of Specialization:

3. Details of published Research Papers, books, monographs reviews, chapter in books, translations and creative positions held:

Please see Annexure B

Participation in conferences, seminars, workshops (give details of the papers presented and/or official positions held):

Organizing Chair/Convener:

- International Conference on Big Data Analytics (BDA), 2012
- International Conference on Management of Data (COMAD), 2006
- International Conference on Very Large Data Bases (VLDB)- Database Workshop, 2006
- International Database Engineering and Applications Symposium (IDEAS), 2006
- Python Workshop for School Teachers, 2014

Member Program Committee

- International Conference- Confluence - The Next Generation Information Technology Summit, 2014
- International Conference on Big Data Analytics (BDA), 2014 (Also, Co-chair, Tutorials)
- International Conference on Big Data Analytics (BDA), 2013 (Also, Co-chair, Publicity and Proceedings)
- IBM-Collaborative Academia Research Exchange (I-CARE), 2013
- International Conference on Big Data Analytics (BDA), 2012
- World Conference on Nature and Biologically Inspired Computing (NaBIC), 2011
- IBM-Collaborative Academia Research Exchange (I-CARE), 2010
- International Conference on Management of Data (COMAD), 2006
- International Database Engineering and Applications Symposium (IDEAS), 2006

Attended Recently:

- ACM Genetic and Evolutionary Computation Conference (GECCO), Vancouver, B.C., 2014
- ACM India Annual Event, New Delhi, 2014

- Conference on Data Sciences (CoDS), New Delhi, 2014
- International Conference on Big Data Analytics (BDA), New Delhi, 2013
- IBM-Collaborative Academia Research Exchange (I-CARE) Conference, New Delhi, 2013
- International Conference on Soft Computing for Problem Solving (SocProS), NOIDA, 2013
- International Conference on Big Data Analytics (BDA), New Delhi, 2012
- International Symposium on Software Engineering Education, Paris, 2012
- International Conference on Intelligent Systems Design and Applications (ISDA), Cordoba (Spain), 2011

4. Summer Institutes, refreshers of orientation courses, attended. Give Details:

Courses Completed Successfully

- Introduction to Probability, May 2014, Edx
- Data Management for Clinical Research, Sep 2013, Vanderbilt University, Coursera
- Social and Economic Networks: Models and Analysis, Apr 2013, Stanford University, Coursera
- Image and video processing: From Mars to Hollywood with a stop at the hospital Jan 2013, Duke University, Coursera

5. Details of Research guidance/ Professional consultancy, if any:

Ph. D. Dissertation supervised:

1. Manoj Agarwal. 2014. Multi Robot Coalition Formation in Multiobjective Perspective.
2. Anamika R. Gupta. 2012. Lattice based Rule Mining. (jointly with Vasudha Bhatnagar)
3. Charu Puri. 2011. Objective Function based Fuzzy Subspace Clustering.
4. Arpita Agarwal. Evaluation of Adaptive Hypermedia Systems.
5. Ahmed Sultan. 2005. On Quantification of Novelty in Knowledge Discovery Process. (jointly with Vasudha Bhatnagar)

Ph. D. Dissertation- in progress:

1. Shikha Gupta. Community Detection in Social Network.

6. Membership or fellowship of professional/Academic Bodies, Societies etc. Give Details:

- a. Senior Member: Computer Society of India
- b. Member: ACM
- c. Fellow: IETE

7. Any other information regarding academic activities not covered under this Section:

Section III

1. Details of your contribution to the corporate life of your institution

a. Curriculum Development:

Regularly participated in curriculum development, lead teams for developing guidelines for under-graduate teaching, and sample question papers.

b. Cultural/Extra Curricular Activity:

- i. Faculty Advisor, Delhi University Computer Science Society

c. Sports/Community and Extension Services:

d. Administrative Assignment

- i. Head, Department of Computer Science: October 2002 – October 2005

e. Any Other

- i. Held the responsibilities like secretary, department research council, department council, and committee of courses

2. Any other information not covered in the above questionnaire:

I certify that the information given above is correct and factual to the best of my knowledge.

Residential Address:

66 Raj Nagar

Pitam Pura

Delhi – 110034

Telephone No. : 9871540777

Signature _____

Department Computer Science

Date 22-07-2014

Forwarded the Facts stated above have been verified and found correct.

Place: Delhi

Date: 22-07-2014

Head of the Department
(Signature with Rubber Stamp)

Annexure A

Books

Compiler Design:

Aho, A. V., Lam, M. S., Sethi, R., & Ullman, J. D. (2006). *Compilers: Principles, Techniques, and Tools*. Pearson.

Mogensen, T. Æ. (2010). *Basics of Compiler Design*. Lulu.

Holub, A. I. (1990). *Compiler Design in C*. Prentice-Hall.

Automata Theory:

Hopcroft, J. E., Motwani, R., & Ullman, J. D. (2006). *Introduction to Automata Theory, Languages, and Computation*. Pearson.

Lewis, H., & Papadimitriou, C. H. (1997). *Elements of the Theory of Computation*. Prentice Hall.

Data Mining:

Witten, I. H., & Eibe, F. (2011). *Data Mining: Practical Machine Learning Tools and Techniques*. Morgan Kaufmann.

Tan, P.-N., Steinbach, M., & Kumar, V. (2007). *Introduction to Data Mining*. Pearson.

Höppner, F., Klawonn, F., Kruse, R., & Runkler, T. (1999). *Fuzzy Cluster Analysis: Methods for Classification, Data Analysis and Image Recognition*. Wiley-Blackwell.

Computational Intelligence:

Michalewicz, Z. (2011). *Genetic Algorithms + Data Structures = Evolution Programs*. Springer.

Rutkowski, L. (2010). *Computational Intelligence: Methods and Techniques*. Springer.

Deb, K. (2009). *Multi-Objective Optimization Using Evolutionary Algorithms*. Wiley.

Abe, S. (2006). *Support Vector Machines for Pattern Classification*. Springer.

Zimmermann, H.-J. (2001). *Fuzzy Set Theory - and Its Applications*. Springer.

Goldberg, D. E. (1989). *Genetic Algorithms in Search, Optimization, and Machine Learning*. Addison-Wesley.

Web References

Aiken, A. (2013). *Stanford Online Course: Compiler Design*.

Ng, A. (2011). *Stanford online Machine Learning Course*.

Patel, N. (2003). *MIT Open Source: Data Mining*.

Journal/Conference Articles

Langdon, W. B. (2011). Graphics Processing Units and Genetic Programming: An Overview. *Soft Computing*, 15, 1657-1669.

Zhang, Z. (2011). Quantum-Inspired Evolutionary Algorithms: A Survey and Empirical Study. *Journal of Heuristics*, 17(3), 303-351

Fortunato, S. (2010). Community Detection in Graphs. *Physics Reports*, 486(3), 75-174.

Noble, W. S. (2006). What is a Support Vector Machine? *Nature Biotechnology*, 24(12), 1565-1567.

Xu, R., & Wunsch, D. (2005). Survey of Clustering algorithms. *Neural Networks, IEEE Transactions on*, 16, 645-678.

Blom, C., & Roli, A. (2003). Metaheuristics in Combinatorial Optimization: Overview and Conceptual Comparison. *ACM Computing Surveys*, 35(3), 268-308.

Deb, K. (2003). Multi-Objective Evolutionary Algorithms: Introducing Bias Among Pareto-Optimal Solutions. *Advances In Evolutionary Computing*, 263-292. Springer.

Jain, A. K., Murty, M. N., & Flynn, P. J. (1999). Data Clustering: A Review. *ACM Computing Surveys (CSUR)*, 31(3), 264-323.

Eberhart, R. C., & Shi, Y. (1998). Comparison Between Genetic Algorithms and Particle Swarm Optimization. *Evolutionary Programming VII*, 611-616.

Zadeh, L. A. (1996). Fuzzy Logic= Computing With Words. *Fuzzy Systems, IEEE Transactions on*, 4(2), 103-111.

Kennedy, J., Eberhart, R., & others. (1995). Particle Swarm Optimization. *Proceedings of IEEE International Conference on Neural Networks*, 4, 1942-1948.

Agrawal, R., Srikant, R., & others. (1994). Fast Algorithms for Mining Association Rules. *Proceedings of International Conference on Very Large Data Bases, VLDB, 1215*,. 487-499.

Annexure B

Book Chapters: Published

- Bhatnagar, V., Gupta, A., & Kumar, N. (2009). Algorithms for Association Rule Mining. In *Encyclopedia of Artificial Intelligence*, 76-84. IGI Global.
- Gupta, A., Gupta, S., & Kumar, N. (2009). Mining Frequent Closed Itemsets for Association Rules. In *Encyclopedia of Artificial Intelligence*, 537-546. IGI Global.
- Gupta, S., Taneja, S., & Kumar, N. (To appear). Redefining the Classroom: Integration of Open and Classroom Learning in Higher Education. In *Macro-Level Learning Through Massive Open Online Courses (MOOCs)-Strategies and Predictions for the Future*. IGI Global.

Research Papers: Published in Journals

- Agarwal, M., Kumar, N., & Vig, L. (2014). Non-additive Multi-objective Robot Coalition Formation. *Expert Systems with Applications*, 41(8), 3736-3747. IF 1.965, SJR 1.487
- Aggarwal, A., & Kumar, N. (2011). SAHAM: Shared Adaptive Hypermedia Application Model. *International Journal of Computer Applications in Technology*, 40(1), 138-145. SJR 0.25
- Agarwal, M., Vig, L., & Kumar, N. (2011). Multiple Objective Robot Coalition Formation. *Journal of Intelligent Systems*, 20(4), 395-413. SJR 0.16
- Puri, C., & Kumar, N. (2011). Projected Gustafson-Kessel Clustering Algorithm and Its Convergence. *Transactions on Rough Sets XIV*, 159-182.
- Bhatnagar, V., Al-Hegami, A. S., & Kumar, N. (2006). Novelty as a Measure of Interestingness in Knowledge Discovery. *International Journal of Information Technology*, 2(1).
- Gupta, A., Kumar, N., & Bhatnagar, V. (2005). Analysis of Medical Data Using Data Mining and Formal Concept Analysis. *World Academy of Science, Engineering and Technology*, 11, 61-64. SJR 0.12

Research Papers: Accepted for Publication in Journals

- Verma, H., Agrawal, R. K., & Naveen, K. (2014). Improved Fuzzy Entropy Clustering Algorithm for MRI Brain Image Segmentation. *Signal, Image and Video Processing (SIVP)*. IF 1.019, SJR 0.29

Research Papers: Under Review in Journals

- Gupta, A., Kumar, N., & Bhatnagar, V. (2014). Mining of Multiobjective Associative Classifiers. *International Journal of Cybernetics and Systems*. SJR 0.54
- Puri, C., & Kumar, N. (2014). Rough Fuzzy C-Means Subspace Clustering. *In Fuzzy Sets and Systems*. IF 1.880, SJR 1.558
- Puri, C., & Kumar, N. (2014). Gustafson Kessel Possibilistic Subspace Clustering. *In Fundamenta Informaticae*. IF 0.479 SJR 0.68

Research Papers: Published in Conferences

- Gupta, S., Taneja, S., & Kumar, N. (2014). Quantum Inspired Genetic Algorithm for Community Structure Detection in Social Networks. *In ACM International Conference on Genetic and Evolutionary Computation Conference (GECCO)*, 1119-26. H5-index 31
- Gupta, S., & Kumar, N. (2014). GPU-based Massively Parallel Quantum Inspired Genetic Algorithm for Detection of Communities in Complex Networks. *In ACM International Conference on Genetic and Evolutionary Computation Conference (GECCO companion)*, 163-64. H5-index 31
- Gupta, S., & Kumar, N. (2014). Parameter Tuning in Quantum-Inspired Evolutionary Algorithms for Partitioning Complex Networks. *In ACM International Conference on Genetic and Evolutionary Computation Conference (GECCO companion)*, 1045-48. H5-index 31
- Gupta, A., Kumar, N., & Bhatnagar, V. (2012). Mining of Multiobjective Non-redundant Association Rules in Data Streams. *International Conference on Artificial Intelligence and Soft Computing*, 73-81. Springer, LNCS. H5-index 13
- Gupta, S., & Kumar, N. (2012). Higher Education – A Paradigm Shift Towards Integration of Traditional and Online Education. *Academic Congress, University of Delhi*. Delhi.
- Agarwal, M., Vig, L., & Kumar, N. (2011). MORCFA: A Multiple Objective Robot Coalition Formation Algorithm. *5th Indian International Conference on Artificial Intelligence (IICAI)*, 268-279. H5-index 6
- Agarwal, M., Vig, L., & Kumar, N. (2011). Multi-objective Robot Coalition Formation for Non-additive Environments. *4th International Conference on Intelligent Robotics and Applications (ICIRA)*, 346-355. H5-index 9

- Puri, C., & Kumar, N. (2011). Projected Rough Fuzzy c-means clustering. *International Conference on Intelligent Systems Design and Applications (ISDA)*, 530-536. H5-index 15
- Gupta, A., Bhatnagar, V., & Kumar, N. (2010). Mining Closed Itemsets in Data Stream Using Formal Concept Analysis. *International Conference on Data Warehousing and Knowledge Discovery*, 285-296. Springer, LNCS. H5-index 14
- Kant, S., Kumar, N., Gupta, S., Singhal, A., & Dhasmana, R. (2009). Impact of Machine Learning Algorithms on Analysis of Stream Ciphers. *International Conference on Methods and Models in Computer Science (ICM2CS)*, 251-258.
- Kumar, N., Ojha, S., Jain, K., & Lal, S. (2009). BEAN: A Lightweight Stream Cipher. In 2nd *ACM International Conference on Security of Information and Networks*, 168-171. H5-index 11
- Kumar, N., & Puri, C. (2009). Projected Gustafson Kessel Clustering. *International Conference on Rough Sets, Fuzzy Sets, Data Mining and Granular Computing*, 431-438. Springer, LNCS. H5-index 10
- Ojha, S. K., Kumar, N., Jain, K., & others. (2009). TWIS--A Lightweight Block Cipher. *International Conference on Information Systems Security*, 280-291. Springer, LNCS. H5-index 12
- Puri, C., & Kumar, N. (2009). A Type-2 Projected FCM. *International Conference on Methods and Models in Computer Science (ICM2CS)*, 1-8.
- Agarwal, M., Agrawal, R. K., & Kumar, N. (2006). Identification of Relevant Feature Sets for Multi-class Intrusion Detection Problem. *National Conference on Methods and Models in Computing*, 145-151.
- Kumar, N., Gupta, A., & Bhatnagar, V. (2006). Fast Construction of Concept Lattice. *4th International Conference on Concept Lattices and their Applications*, 10, 315-316.
- Aggarwal, A., Grover, P., & Kumar, N. (2005). Applying ISO 9126 for Quality Evaluation of Adaptive Hypermedia Systems. *World Conference on Educational Multimedia, Hypermedia and Telecommunications*.
- Bhatnagar, V., Al-Hegami, A. S., & Kumar, N. (2005). A Hybrid Approach for Quantification of Novelty in Rule Discovery. *Proceedings of World Academy of Science, Engineering and Technology*, 4, 39-42.
- Gupta, A., Kumar, N., & Bhatnagar, V. (2005). Incremental Classification Rules Based on Association Rules Using Formal Concept Analysis. *International Conference on Machine Learning and Data Mining in Pattern Recognition*, 11-20. Springer, LNCS. H5-index 10

Kumar, N., & Narang, V. (2005). Mining Positive and Negative Association Rules Based on Closed Itemsets: An Approach for Generalized Rules. *International Conference on Data Mining (DMIN)*, 104-118. H5-index 8

Al-Hegami, A. S., Bhatnagar, V., & Kumar, N. (2004). Novelty Framework for Knowledge Discovery in Databases. *International Conference on Data Warehousing and Knowledge Discovery*, 48-57. Springer, LNCS. H5-index 14

Mital, N., Kumar, N., & Bhatnagar, V. (2004). Mining Multiple Table Databases With Multiple Minimum Support Constraints. *Data Mining and Knowledge Discovery: Theory, Tools, and Technology*, 190-200.

Narang, V., & Kumar, N. (2004). Mining Fuzzy Conceptual Clusters and Constructing the Fuzzy Conceptual Frame Lattices. *Data Mining and Knowledge Discovery: Theory, Tools, and Technology*, 201-208.

Books

Kumar, N. (1994), *Computer Science Concepts*. Galgotia Publications.

Taneja, S., & Kumar, N. , *Computer Science Concepts, using Python*. In Press.

Banati, H., Goel, A., Kumar, N., Malik, S., Saxena, R., & Taneja, S., *Data Management Applications*. In Press.