

## Himanshu Gupta

### Current Employment

- Associate Professor, Department of Computer Science, State University of New York, Stony Brook, NY.

### Education

- M.S. and Ph.D., Department of Computer Science, Stanford University, 1995-1999.
- M. S., Department of Computer and Information Science, Ohio State University, 1992-1994.
- B.Tech., Dept. of Computer Science and Engineering, Indian Institute of Technology, Bombay, 1992.

### Past Appointments

- Visiting Assistant Professor, Department of Computer Science, Univ. of Chicago. (09/01- 08/02).
- Senior Member of Technical Staff, Ezode Inc. (2/01 to 9/01).
  - Led development of an XML database query engine with appropriate optimization techniques.
- Senior Engineer, Escalate Inc. (9/99 to 2/01).
  - Involved in development of large scale web-based database applications.

### Journal Publications

1. G. Fusco and H. Gupta. e-net Approach to Sensor k-Coverage. *EURASIP Journal on Wireless Communications and Networking*, 2010.
2. M. Al-ayyoub, H. Gupta. Joint Routing, Channel Assignment, and Scheduling for Throughput Maximization in General Interference Models. *IEEE Transactions on Mobile Computing*, 9 (4), 2010.
3. X. Zhu, H. Gupta, B. Tang. Join of Multiple Data Streams in Sensor Networks. *IEEE Transactions on Knowledge and Data Engineering*, Jan 2009.
4. A. Prabhu, H. Gupta, S. Das. Minimum-Interference Channel Assignment in Multi-Radio Wireless Mesh Networks. *IEEE Transactions on Mobile Computing*, 7 (12), 2008.
5. Z. Zhou, S. Das, H. Gupta. Variable Radii Connected Sensor Cover in Sensor Networks. *ACM Transactions on Sensor Networks*, 5 (1), 2009.
6. B. Tang, H. Gupta, S. Das. Benefit-based Data Caching in Ad Hoc Networks. *IEEE Transactions on Mobile Computing*, 7 (3), 2008.
7. H. Gupta, V. Navda, S. Das, V. Chowdhary. Energy-Efficient Gathering of Correlated Data in Sensor Networks. *ACM Transactions on Sensor Networks*, 4(1), 2008.

8. H. Gupta, R. Wenger. Constructing Pairwise Disjoint Link Paths with Few Links. *ACM Transactions on Algorithms*, 3(3), 2007.
9. V. Chowdhary, H. Gupta. Communication-Efficient Implementation of Join Operation in Sensor Networks. Elsevier's *Ad Hoc Networks*, 5(6), 2007.
10. B. Tang, S. Das, H. Gupta. Cache Placement in Sensor Networks Under Update Cost Constraint. *Journal of Discrete Algorithms*, 5(3), 2007.
11. H. Gupta, S. Das, Q. Gu, Z. Zhou. Connected Sensor Cover: Self-Organization of Sensor Networks for Efficient Query Execution. *ACM/IEEE Transactions on Networking (TON)*, 14(1), 2006.
12. H. Gupta, I.S. Mumick. Incremental Maintenance of Aggregate and Outerjoin Expressions. In *Information Systems*, 31(6), 2006.
13. H. Gupta, I. Mumick. Selection of Views to Materialize in a Data Warehouse. *IEEE Transactions of Knowledge and Data Engineering (TKDE)*, 17(1), 2004.
14. H. Gupta, R. Wenger. Constructing Piecewise Linear Homeomorphisms in Simple Polygons. *Journal of Algorithms*, 22(1), 1997.
15. H. Gupta, P. Sadayappan. Communication-Efficient Matrix Multiplication on Hypercubes. *Parallel Computing*, 22(1), 1996.

### **Conference Publications**

1. M. Al-ayyoub and H. Gupta. Truthful Spectrum Auctions with Approximate Revenue. INFOCOM, 2011.
2. N. Azimi, H. Gupta, X. Hou, J. Gao. Data Preservation Under Spatial Failures in Sensor Networks. ACM MobiHoc, 2010.
3. G. Fusco and H. Gupta. Placement and Orientation of Rotating Directional Sensors. IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON), 2010.
4. G. Fusco and H. Gupta. e-net Approach to Sensor k-Coverage. International Conference on Wireless Algorithms, Systems and Applications (WASA), 2009.
5. G. Fusco and H. Gupta. Selection and Orientation of Directional Sensors for Coverage Maximization. IEEE SECON, 2009.
6. H. Gupta, X. Zhu, X. Xu. Deductive Framework for Programming Sensor Networks. International Conference on Data Engineering (ICDE), 2009.
7. A. Prabhu, M. Al-ayyoub, H. Gupta, S. Das, M. Buddhikot. Near-Optimal Dynamic Spectrum Allocation in Cellular Networks. IEEE DySpan 2008.
8. Z. Zhou, H. Gupta, S. Das, X. Zhu. Slotted Scheduled Tag Access in Multi-Reader RFID Systems. *IEEE International Conference on Network Protocols (ICNP)*, 2007.
9. A. Prabhu, H. Gupta, S. Das, M. Buddhikot. Spectrum Allocation in Dynamic Spectrum Access Based Networks. *IEEE International Conference on Dynamic Spectrum (DySpan)*, 2007.
10. S. Jain, S. Das, H. Gupta. Distributed Protocols for Scheduling and Rate Control to achieve Max-Min Fairness in Wireless Mesh Networks. *IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM)*, 2007.

11. A. Prabhu, H. Gupta, S. Das. Minimum-Interference Channel Assignment in Multi-Radio Wireless Mesh Networks. *IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON)*, 2007.
12. X. Zhu, H. Gupta. Fault-Tolerant Routing to Mobile Destinations in Sensor Networks. *IEEE International Conference on Communications (ICC)*, 2007.
13. B. Tang, H. Gupta, S. Das, Benefit-based Data Caching in Ad Hoc Networks. *IEEE International Conference on Network Protocols (ICNP)*, 2006.
14. R. Maheshwari, H. Gupta, S. Das. MAC Protocol for Multiple Channels. *IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON)*, 2006.
15. B. Tang, H. Gupta. Data Caching with Number Constraint. *IEEE International Conference on Communications (ICC)*, 2006.
16. U. Kumar, H. Gupta, S. Das. A Topology Control Approach to Using Directional Antennas in Wireless Mesh Networks. *IEEE International Conference on Communications (ICC)*, 2006.
17. A. Pandit, H. Gupta. Communication-Efficient Implementation of Range-Joins in Sensor Networks. *International Conference on Database Systems for Advanced Applications (DASFAA)*, 2006.
18. H. Gupta, V. Navda, S. Das, V. Chowdhary. Energy-Efficient Gathering of Correlated Data in Sensor Networks. *ACM Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc)*, 2005.
19. B. Tang, S. Das, H. Gupta. Cache Placement in Sensor Networks Under Update Cost Constraint. *International Conference on Ad-Hoc Networks and Wireless (AdHoc-Now)*, 2005.
20. Z. Zhou, S. Das, H. Gupta. Fault Tolerant Connected Sensor Cover with Variable Sensing and Transmission. *IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON)*, 2005.
21. V. Chowdhary, H. Gupta. Communication-Efficient Implementation of Join Operation in Sensor Networks. *International Conference on Database Systems for Advanced Applications (DASFAA)*, 2005.
22. X. Zhu, B. Tang, H. Gupta. Delay Efficient Data Gathering in Sensor Networks. *International Conference on Mobile Ad-Hoc and Sensor Networks (MSN)*, 2005.
23. Z. Zhou, S. Das, H. Gupta. Variable Radii Connected Sensor Cover in Sensor Networks. *IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON)*, 2004.
24. Z. Zhou, S. Das, H. Gupta. Connected K-Coverage Problem in Sensor Networks. *International Conference on Computer Communications and Networks (ICCCN)*, 2004.
25. H. Gupta, S. Das, Q. Gu. Connected Sensor Cover: Self-Organization of Sensor Networks for Efficient Query Execution. *ACM Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc)*, 2003.
26. H. Gupta, I.S. Mumick. Selection of Views to Materialize Under a Maintenance-Time Constraint. *International Conference on Database Theory (ICDT)*, 1999.
27. H. Gupta, D. Srivastava. Data Warehouse of Newsgroups. *International Conference on Database Theory (ICDT)*, 1999.

28. H. Gupta. Selection of Views to Materialize in a Data Warehouse. *International Conference on Database Theory (ICDT)*, 1997.
29. H. Gupta, R. Wenger. Constructing Pairwise Disjoint Link Paths with Few Links. *Workshop on Algorithms and Data Structures (WADS)*, 1997.
30. H. Gupta, V. Harinarayan, A. Rajaraman, and J. Ullman. Index Selection for OLAP. *International Conference on Data Engineering (ICDE)*, 1997.
31. H. Gupta, P. Sadayappan. Communication-Efficient Matrix Multiplication on Hypercubes. *ACM Symposium on Parallel Algorithms and Architectures (SPAA)*, 1994.

### **NSF Awards**

1. III-COR: Deductive Framework for Programming Sensor Networks. (**PI: Gupta**, Co-PIs: S. Das, D. Warren), 9/2007-9/2010. \$450,000. Personal share of money: 90%.
2. NOSS: Declarative Framework for Learning and Evaluating Probabilistic Models of Events in Sensor Networks (**PI: Gupta**; Co-PIs: S. Das, C Ramakrishnan, IV Ramakrishnan, D. Warren), 9/2007-9/2010. \$350,000. Personal share of money: 50%.
3. NOSS: Airborne Video Sensor Networks for Surveillance and Emergency Response (**PI: Gupta**; Co-PIs: G. Nejat, D. Samaras, C. Ramakrishnan), 9/2007-9/2010. \$500,000. Personal share of money: 40%.
4. NeTS-NECO: A Market-Driven Approach to Dynamic Spectrum Sharing. (PI: S. Das, Co-Pi: H. Gupta; Other participating institutions: Virginia Tech, Bell Labs), 9/2008-9/2012. \$1M. Personal share of money: 20%.
5. NeTS: Small: Collaborative Research: Understanding Traffic Dynamics in Cellular Data Networks and Applications to Resource Management. (PI: S. Das, Co-Pi: H. Gupta; Other participating institutions: Bell Labs), 9/2011-9/2015. \$500k. Personal share of money: 20%.

### **Graduated Students**

- Mahmoud Al-ayyoub (Ph.D., Assistant Professor, U. of Jordan)
- Xianjin Zhu (Ph.D., Microsoft)
- Xiang Xu (M.S., Microsoft)
- Bin Tang (Ph.D., Assistant Professor., Wichita State University)
- Zongheng Zhou (Ph.D., Ask.com; co-advised with S. Das)
- Vishal Chowdhary (M.S., Microsoft)
- Aditi Pandit (M.S., Informatica)
- Umesh Kumar (M.S., Amazon)
- Pramod Addidam (M.S., Google)

### **Current Ph.D. Students**

- Navid Azmi
- Giordano Fusco

## Courses Taught

- Analysis of Algorithms (undergraduate)
- Principles of Databases (undergraduate)
- Theory of Database Systems (graduate)
- Advanced Database Systems (graduate)
- Topics in Ad Hoc and Sensor Networks (graduate)
- Seminar on Wireless Ad Hoc Networks (graduate)

## University Service

- Chair, Committee for Building Renovations and Quality of Life
- Organizer of CS Distinguished Lecturer Series
- Member, Committee for CS Graduate Admissions
- Member, Committee for Ph.D. Qualifiers
- Member, Web Committee
- Faculty Advisor to SUNY ACM Chapter and UPE Society

## Professional Service

- Judge, Davidson Fellows Scholarship (for high school students), Davidson Institute for Talent Development, Reno, Nevada
- Contributing Author to *Encyclopedia of Database Systems* (to be published by Springer) for the topics: *Incremental Maintenance of Views with Aggregates*, *Self-Maintenance of Views*.
- **Program Committee Member:**
  - ICDCS, 2012
  - DCOSS, 2012
  - MobiCom, 2011
  - IEEE Global Communications Conference (GlobeCom), 2008
  - International Conference on Parallel Processing (ICPP), 2008
  - IEEE International Workshop on Sensor Networks Technologies for Information Explosion Era (SeNTIE), 2008
  - International Workshop on Data Intensive Sensor Networks (DISN), 2007
  - IEEE Global Communications Conference (GlobeCom), 2007
  - IEEE Vehicular Technology Conference, 2006
  - ACM Conference on Information and Knowledge Management (CIKM), 2006
  - International VLDB Workshop on Data Management for Sensor Networks (DMSN), 2006
  - International Conference on Mobile and Ubiquitous Systems (Mobiquitous), 2006

- International Conference on Networks and Systems Communications (ICSNC), 2006
- IEEE International Workshop on Next Generation Wireless Networks (WoNGeN), 2005
- ACM Conference on Information and Knowledge Management (CIKM), 2004
- ACM Conference on Information and Knowledge Management (CIKM), 2003
- Design and Management of Data Warehouses (DMDW), 2003
- Design and Management of Data Warehouses (DMDW), 2002
- **Paper Reviews:** Reviewed papers for the following journals, and conferences.
  - ACM Transactions on Database Systems (ToDS)
  - ACM Transactions on Sensors Networks (TOSN)
  - ACM/Springer Wireless Networks Journal
  - Ad Hoc Networks – Elsevier
  - Computer Communications Journal – Elsevier
  - Computer Networks – Elsevier
  - Data & Knowledge Engineering (DKE) – Elsevier
  - IEEE Transactions on Knowledge and Data Engineering (TKDE)
  - IEEE Transactions on Parallel and Distributed Systems (TPDS)
  - IEEE Transactions on Mobile Computing (TMC)
  - IEEE/ACM Transactions on Networking (ToN)
  - IEEE Communications Magazine
  - IEEE International Conference on Communications (ICC), 2006
  - IEEE Transactions on Computers (TC)
  - IEEE Transactions on Medical Imaging (TMI)
  - IEEE Transactions on Vehicular Technology (TVT)
  - IEEE Transactions of Neural Networks (TNN)
  - IEE Proceedings Communications
  - International Journal of Cooperative Information Systems (IJCIS)
  - International Journal of Distributed and Parallel Databases (Parallel and Distributed Data Mining)
  - International Journal on Knowledge and Information Systems (KAIS)
  - International Journal on Very Large Data Bases (VLDB Journal)
  - Journal of Aerospace Computing, Information, and Communication
  - Wiley International Journal of Communication Systems
  - International Conference on Very Large Data Bases (VLDB), 2001
  - Wireless Networking Symposium, 2003
  - International Conference on Mobile Computing and Networking (MobiCom), 2004
  - International Conference on Mobile Computing and Networking (MobiCom), 2006
  - IEEE Communications Society Conference on Sensor, Mesh, and Ad Hoc Communications and Networks (SECON), 2007
  - IEEE INFOCOM, 2008