

Biographical Sketch for Shashi Shekhar

Shashi Shekhar is currently a Distinguished McKnight University Professor of Computer Science at the University of Minnesota, Minneapolis, MN, USA. He received the *IEEE-Computer Society (CS) Technical Achievement Award* (2006) and was elected an *IEEE Fellow* (2003) as well as an *AAAS Fellow* (2008) for contributions to spatial databases, spatial data mining, and geographic information systems (GIS). He has co-authored a textbook on Spatial Databases (Prentice Hall, 2003), co-edited an *Encyclopedia of GIS* (Springer, 2008) and published over 225 research papers in peer-reviewed journals, books, conferences, and workshops. He is a co-Editor-in-Chief of *Geo-Informatica: An International Journal on Advances in Computer Sc. for GIS* (Springer) and a member of the Mapping Sciences Committee of the National Academy of Science National Research Council. Earlier, he served as on the Board of Directors of the University Consortium for GIS, the editorial boards of IEEE Transactions on Knowledge and Data Engineering and the IEEE-CS Computer Science & Engineering Practice Board. He also served in significant leadership roles for the ACM-SIG-Spatial Intl. Conference on Advances in GIS, SIAM Intl. Conf. on Data Mining, IEEE Intl. Conf. on Data Mining (ICDM), IEEE ICDM Workshop on Spatial and Spatio-temporal Data Mining, etc. Recent research accomplishments include co-location patterns for mining spatial databases, and capacity constrained routing algorithms for evacuation planning. Previously, his group developed CCAM, one of the most efficient storage and indexing methods for large road maps, as well as scalable algorithms for computing shortest paths for in-vehicle navigation devices. More details are available on <http://www.cs.umn.edu/~shekhar>.

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Professional Preparation

1990	Ph.D., Computer Science	University of California, Berkley
1989	M.S., Business Administration	University of California, Berkeley
1987	M.S., Computer Science	University of California, Berkley
1985	B.S., Computer Science	Indian Inst. of Tech., Kanpur, India

Appointments

2005 -	McKnight Distinguished Univ. Prof., U of Minnesota, Minneapolis, MN
2001 -	Professor, University of Minnesota, Minneapolis, MN
1995-2000	Assoc. Professor, University of Minnesota, Minneapolis, MN
1989-1995	Asst. Professor, University of Minnesota, Minneapolis, MN

Research Interests:

Data and knowledge engineering, spatial database management, spatial data mining, and geographic information systems.

Representative Publications (Out of over 225)

1. Contraflow Transportation Network Reconfiguration for Evacuation Route Planning. IEEE Transactions on Knowledge & Data Eng., 20(8), 2008. (A Summary of Results appeared in Proc. ACM Intl. Conf. on GIS, 2007).
2. Spatio-temporal Network Databases and Routing Algorithms: A Summary of Results, with B. George et al, Proc. Intl. Symposium on Spatial and Temporal Databases, 2007. (Full version submitted to IEEE Transactions on Knowledge. & Data Engineering.)

3. Capacity Constrained Routing Algorithms for Evacuation Planning: A Summary of Results, with Q. Lu et al., Proc. of 9th *Intl. Sym. on Spatial and Temporal Databases*, 2005. (Full version in *Int. J. Semantic Computing*, 1(2), 2007, Wolrd Scientific.)
4. Navigation Systems: A Spatial Database Perspective, with R. Vatsavai, et al., Chapter 3 in "*Location Based Services*" (Ed. J. Schiller et al) , Morgan Kaufmann, 2004.
5. CCAM: A Connectivity-Clustered Access Method for Networks and Network Computations, with D. Liu, *IEEE Trans. on Knowledge and Data Engineering*, 9(1), Jan. 1997. (A summary of results appeared in Proc. IEEE Intl. Conf. on Data Eng., 1995).
6. Materialization Trade-Offs in Hierarchical Shortest Path Algorithms, with A. Fetterer et al, *Proc. Intl. Symposium on Large Spatial Databases*, 1997.
7. Encyclopedia of GIS, (Co-Ed. with H. Xiong), Springer Verlag, 2008, isbn 0387359753.
8. A Tour of Spatial Databases (with S. Chawla), Prentice Hall, 2003, isbn 013-017480-7.
9. Trend in Spatial Data Mining, with R. Vatsavai et al., in "Data Mining: Next Generation Challenges and Future Directions", (Ed. H. Kargupta et al), MIT Press, 2nd Ed., 2008.
10. Clustering and Information Retrieval (Co-Editor with W. Wu, H. Xiong), Springer, 2003.

Representative Grants

1. P.I., IGERT: Non-equilibrium Dynamics Across Space and Time: A Common Approach for Engineers, Earth Scientists and Ecologists, \$2,269,282 (approx.), National Science Foundation (**NSF**), DGE-0504195, Aug. 2005 – July 2010.
2. P.I., III-CXT: Spatio-temporal Graph Databases for Transportation Science, \$449,993 (approx.), National Science Foundation (**NSF**), IIS-0713214, Aug. 2007 – July 2010.
3. P.I., Spatio-temporal Pattern Mining for Multi-Jurisdiction Multi-Temporal Activity Datasets, \$750,000 (approx.), U.S. Department of Defense (**USDOD**), HM1582-07-1-2035, Aug. 14, 2007 – July 31, 2012.
4. P.I., Spatio-temporal Data Analysis Techniques for Behavioral Ecology, \$576,395, National Science Foundation (**NSF**), September 2004 – August 2007.
5. Co-PI, Discovery of Changes from the Global Carbon Cycle and Climate, **NASA** (Ames Research Center), \$525,091, March 2001 – February 2004.

Synergistic Activities

- Recent research project on evacuation route planning was feature in annual UM-OVPR "Research" magazine (2007), UM Foundation "Legacy" magazine (summer 2007), Fox TV evening news (May 2005), etc. It also received the UM-Center for Transportation "Research Partnership Award" (2006).
- AAAS Fellow (2008), IEEE-Computer Society Technical Achievement Award (2006), IEEE Fellow (2003), Member of the Mapping Science Committee (National Academies NRC) and the Board of Directors of University Consortium of Geographic Information Systems (UCGIS) for 2003-2004;
- Invited keynote speaker on spatial data mining at many forums, e.g. NSF DIMACS Workshop on Bio-informatics (2007), IEEE ICDM Workshop on Spatio-temporal Data Mining (2006), Intl. Symposium on Spatial and Temporal Databases (2005), ISPRS Intl. Symp. on Spatial Data Mining (2005), Intl. Conf. on Geographic Information Science (2004), and SAS data mining conf. (2003);
- Active participation in broadening the participation of groups underrepresented in science via supervising a dozen female students (4 Ph.D.s graduated), and over two dozen undergraduate (UG) students from historically black colleges in AHPCRC annual summer workshops (1997-present), NSF Research Experience for UGs (1999) and UG Research Opportunity Program (UROP).