

# George Kollios

## Curriculum Vitae

Computer Science Department  
Boston University  
111 Cummington Street  
Boston, MA 02215

Email: gkollios@cs.bu.edu  
URL: <http://www.cs.bu.edu/faculty/gkollios>  
Phone: 617-358-1835  
Fax: 617-353-6457

### Research Interests

Databases, Data Mining, Secure Data Management, Multimedia and Sequence Indexing, Probabilistic Data Management, Spatio-temporal Databases, Approximation Algorithms.

### Education

- SEPT 1996 - JUN 2000: **Ph.D. (Computer Science)**, Computer and Information Science Department, NYU Tandon School of Engineering, Brooklyn, New York.
- SEPT 1996 - JAN 1998: **M.Sc. (Computer Science)**, Computer and Information Science Department, NYU Tandon School of Engineering, Brooklyn, New York.
- SEPT 1990 - SEPT 1995: **Diploma**, Electrical and Computer Engineering, National Technical University of Athens, Greece (5 years curriculum).

### Appointments

- APRIL 2014 - PRESENT : **Professor**, Department of Computer Science, Boston University, Boston, Massachusetts.
- SEPT 2006 - MARCH 2014 : **Associate Professor**, Department of Computer Science, Boston University, Boston, Massachusetts.
- SEPT 2000 - AUGUST 2006: **Assistant Professor**, Department of Computer Science, Boston University, Boston, Massachusetts.
- SEPT 1998 - MAY 2000: **Research Associate**, Department of Computer Science, UC Riverside, Riverside, California.
- SEPT 1996 - MAY 1998: **Research Assistant**, Department Computer and Information Science, Polytechnic University, Brooklyn, New York.

### Honors and Awards

- 10-Year Most Influential Paper Award**, IEEE International Conference on Data Engineering (ICDE), 2014.
- Outstanding Reviewer Award**, IEEE International Conference on Data Engineering (ICDE), 2010.
- Best Paper Award**, IEEE International Conference on Data Engineering (ICDE), 2004.
- NSF CAREER Award**, Information and Intelligent Systems Division, 2002.
- Pearl Brownstein Doctoral Research Award**, Polytechnic University, Brooklyn, New York, 2001.
- Greek National Foundation (IKY) Award for Academic Excellence**, Athens, Greece 1990.

## Research Grants

1. “SaTC: CORE: Medium: Collaborative: Rethinking Access Pattern Privacy: From Theory to Practice”, PI, NSF CNS, 10/1/20-9/30/23, \$300,000.
2. “TWC: TTP Option: Frontier: Collaborative: MACS: A Modular Approach to Cloud Security”, Co-PI (PI Ran Canetti), NSF CNS, 10/1/14-9/30/19, \$4,961,574.
3. “Managing and Mining Uncertain Graphs”, PI, NSF CISE IIS/III, 09/01/13-08/31/16, \$500,000.
4. “SPADE - Secure and PrivAte Database Execution”, BU PI, Subcontract from Telcordia, IARPA SPAR program, 10/01/11-3/1/13, Total \$166,000.
5. “Collaborative Research: Time Series Subsequence Matching for Content-based Access in Very Large Multimedia Databases”, PI, NSF CISE IIS/III, 09/01/08-08/31/11, \$224,998.
6. “Collaborative Research: Towards Trustworthy Database Systems”, PI, with Leo Reyzin (Co-PI), NSF Cyber Trust, 10/01/08-9/30/11, \$236,038.
7. “CAREER: Efficient Indexing and Data Mining in Spatio-Temporal Databases”, PI, CAREER Award, NSF CISE IDM/IIS, 3/02-2/07, \$322,597.
8. “Mining and Indexing Spatio-temporal Patterns in Video Databases of Human Motion”, Co-PI, with S. Sclaroff (PI), and M. Betke, NSF CISE IIS/IDM, 9/03-9/06, \$405,000.
9. “Pattern Discovery in Signed Languages and Gestural Communication”, Co-PI, with C. Neidle (PI), S. Sclaroff, M. Betke, and J. Gips (Boston College), NSF CISE, 10/03- 9/06, \$750,000.
10. “SENSORIUM: Research Infrastructure for Managing Spatio-Temporal Objects in Video Sensor Networks”, NSF Research Infrastructure Award, Senior Personnel with A. Bestavros, M. Betke, J. Byers, S. Sclaroff, M. Crovella, I. Matta, G. Itkis, A. Kfoury, L. Reyzin, R. West, and H. Xi, NSF CISE EIA, 9/02 - 8/07, \$1,247,396.

## Publications in Refereed Conferences

1. Dmytro Bogatov, Georgios Kellaris, George Kollios, Kobbi Nissim, and Adam O’Neill. “ $\epsilon$  psolute: Efficiently Querying Databases While Providing Differential Privacy.” In Proc. of the 2021 ACM SIGSAC Conference on Computer and Communications Security (CCS), pp. 2262-2276, Seoul, Korea, November 2021.
2. Dmytro Bogatov, George Kollios, Leonid Reyzin. “A Comparative Evaluation of Order-Revealing Encryption Schemes and Secure Range-Query Protocols.” PVLDB 2019, Los Angeles, CA, USA, August 2019.
3. Xianrui Meng, Haohan Zhu, George Kollios. “Top-k Query Processing on Encrypted Databases with Strong Security Guarantees.” In Proc. of the 34th IEEE International Conference on Data Engineering (ICDE), pp. 353-364, Paris, France, April 2018.
4. Haohan Zhu, Xianrui Meng, and George Kollios. “NED: An Inter-Graph Node Metric Based On Edit Distance.” PVLDB 2017, Munich, Germany, August 2017.

5. Georgios Kellaris, George Kollios, Kobbi Nissim, and Adam O’Neill. “Generic Attacks on Secure Outsourced Databases.” In Proc. of the 23rd ACM SIGSAC Conference on Computer and Communications Security (CCS), pp. 1329-1340, Vienna, Austria, October 2016.
6. Xianrui Meng, Seny Kamara, Kobbi Nissim, and George Kollios. “GRECS: Graph Encryption for Approximate Shortest Distance Queries.” In Proc. of the 22nd ACM SIGSAC Conference on Computer and Communications Security (CCS), pp. 504-517, Denver, CO, USA, October 2015.
7. Charalampos Mavroforakis, Nathan Chenette, Adam O’Neill, George Kollios, and Ran Canetti. “Modular Order-Preserving Encryption, Revisited.” In Proc. of the 2015 ACM International Conference on Management of Data (SIGMOD), pp. 763-777, Melbourne, Victoria, Australia, June 2015.
8. Haohan Zhu, Xianrui Meng, and George Kollios. “Privacy Preserving Similarity Evaluation of Time Series Data.” In Proc. of the EDBT 2014, Athens, Greece, March 2014.
9. Haohan Zhu, George Kollios, and Vassilis Athitsos. “A Generic Framework for Efficient and Effective Subsequence Retrieval.” PVLDB 2012, Istanbul, Turkey, August 2012.
10. Tomasz Nykiel, Michalis Potamias, Chaitanya Mishra, George Kollios, and Nick Koudas. “MR-Share: Sharing Across Multiple Queries in MapReduce.” PVLDB 2010, Singapore, September 2010.
11. Michalis Potamias, Francesco Bonchi, Aris Gionis, and George Kollios. “k-Nearest Neighbors in Uncertain Graphs.” PVLDB 2010, Singapore, September 2010.
12. Panagiotis Papapetrou, Vassilis Athitsos, George Kollios, and Dimitrios Gunopulos. “Reference-Based Alignment in Large Sequence Databases.” In Proc. of the 35th VLDB International Conference on Very Large Databases, Lyon, France, August 2009.
13. Vassilis Athitsos, Panagiotis Papapetrou, Michalis Potamias, George Kollios, and Dimitrios Gunopulos. “Approximate Embedding-Based Subsequence Matching of Time Series.” In Proc. of the 28th ACM International Conference on Management of Data (SIGMOD), pp. 365-378, Vancouver, Canada, June 2008.
14. Vassilis Athitsos, Michalis Potamias, Panagiotis Papapetrou, and George Kollios. “Nearest Neighbor Retrieval Using Distance-Based Hashing.” In Proc. of the 24th IEEE International Conference on Data Engineering (ICDE), pp. 327-336, Cancun, Mexico, April 2008.
15. Ke Yi, Feifei Li, Marios Hadjieleftheriou, Divesh Srivastava, and George Kollios. “Randomized Synopses for Query Assurance on Data Streams.” In Proc. of the 24th IEEE International Conference on Data Engineering (ICDE), pp. 416-425, Cancun, Mexico, April 2008.
16. Ying Yang, Stavros Papadopoulos, Dimitris Papadias, and George Kollios. “Spatial Outsourcing for Location-based Services.” In Proc. of the 24th IEEE International Conference on Data Engineering (ICDE), pp. 1082-1091, Cancun, Mexico, April 2008.
17. Feifei Li, Ke Yi, Marios Hadjieleftheriou, and George Kollios. “Proof-Infused Streams: Enabling Authentication of Sliding Window Queries On Streams.” In Proc. of the 33rd International Conference on Very Large Databases (VLDB), pp. 147-158, Vienna, Austria, September 2007.

18. Spiros Papadimitriou, Feifei Li, George Kollios, and Philip S. Yu. "Time Series Compressibility and Privacy." In Proc. of the 33rd International Conference on Very Large Databases (VLDB), pp. 459-470, Vienna, Austria, September 2007.
19. Vassil Kriakov, Alex Delis, and George Kollios. "Approximate Data Stream Joins in Distributed Systems." In Proc. of the 27th IEEE International Conference on Distributed Computing Systems (ICDCS), Article 5, Toronto, Canada, June 2007.
20. Nikolaos Laoutaris, Georgios Zervas, Azer Bestavros, and George Kollios. "The Cache Inference Problem and its Application to Content and Request Routing." In Proc. of the 26th IEEE INFOCOM Annual Conference on Computer Communications, pp. 848-856, Anchorage, Alaska, May 2007.
21. Stilian Stoev, Marios Hadjieleftheriou, George Kollios, and Murad Taqqu. "Norm, Point, and Distance Estimation Over Multiple Signals Using Max-Stable Distributions." In Proc. of the 23rd IEEE International Conference on Data Engineering (ICDE), pp. 1006-1015, Istanbul, Turkey, April 2007.
22. Feifei Li, Marios Hadjieleftheriou, George Kollios, and Leonid Reyzin. "Dynamic Authenticated Index Structures for Outsourced Databases." In Proc. of the 25th ACM International Conference on Management of Data (SIGMOD), pp. 121-132, Chicago, Illinois, USA, June 2006.
23. Feifei Li, Ching Chang, George Kollios, and Azer Bestavros. "Characterizing and Exploiting Reference Locality in Data Stream Applications." In Proc. of the 22nd IEEE International Conference on Data Engineering (ICDE), Article 81, Atlanta, Georgia, USA, April 2006.
24. Panagiotis Papapetrou, George Kollios, Stan Sclaroff, and Dimitrios Gunopulos. "Discovering Frequent Arrangements of Temporal Intervals." In Proc. of the 5th IEEE International Conference on Data Mining (ICDM), pp. 354-361, New Orleans, Louisiana, USA, November 2005.
25. Marios Hadjieleftheriou, George Kollios, Petko Bakalov, and Vassilis Tsotras. "Complex Spatio-Temporal Pattern Queries." In Proc. of the 31st International Conference on Very Large Data Bases (VLDB), pp. 877-888, Trondheim, Norway, August 2005.
26. Feifei Li, Dihan Chen, Marios Hadjieleftheriou, George Kollios, and Shang-Hua Teng. "On Trip Planning Queries in Spatial Databases." In Proc. of the 9th International Symposium on Spatial and Temporal Databases (SSTD), pp. 273-290, Angra dos Reis, Brazil, August 2005.
27. Vassilis Athitsos, Marios Hadjieleftheriou, George Kollios, and Stan Sclaroff. "Query-Sensitive Embeddings." In Proc. of the 24th ACM International Conference on Management of Data (SIGMOD), pp. 706-717, Baltimore, Maryland, USA, June 2005. (*Invited to ACM TODS as one of the best papers in ACM SIGMOD 2005*)
28. Nikos Mamoulis, Huping Cao, George Kollios, Marios Hadjieleftheriou, Yufei Tao, and David Cheung. "Mining, Indexing, and Querying Historical Spatio-Temporal Data." In Proc. of the 10th ACM International Conference on Knowledge Discovery and Data Mining (SIGKDD), pp. 236-245, Seattle, Washington, USA, August 2004.
29. Vassilis Athitsos, Jonathan Alon, Stan Sclaroff, and George Kollios. "BoostMap: A Method for Efficient Approximate Similarity Rankings." In Proc. of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), pp. 268-275, Washington, DC, USA, July 2004.

30. Vassil Kriakov, Alex Delis, and George Kollios. "Management of Highly Dynamic Multidimensional Data in a Cluster of Workstations." In Proc. of the 9th Conference on Extending Database Technology (EDBT), pp. 748-764, Heraklion, Crete, Greece, March 2004.
31. Jeffrey Considine, Feifei Li, George Kollios, and John Byers. "Approximate aggregation techniques for sensor databases." In Proc. of the 20th IEEE International Conference on Data Engineering (ICDE), pp. 449-460, Boston, Massachusetts, USA, April 2004.
32. Yufei Tao, George Kollios, Jeffrey Considine, Feifei Li, and Dimitris Papadias. "Spatio-Temporal Aggregation Using Sketches." In Proc. of the 20th IEEE International Conference on Data Engineering (ICDE), pp. 214-226, Boston, Massachusetts, USA, April 2004.
33. Marios Hadjieleftheriou, George Kollios, Dimitrios Gunopulos, and Vassilis Tsotras. "On-Line Discovery of Dense Areas in Spatio-Temporal Databases." In Proc. of the 8th International Symposium on Spatial and Temporal Databases (SSTD), pp. 306-324, Santorini, Greece, July 2003.
34. Marios Hadjieleftheriou, George Kollios, and Vassilis Tsotras. "Performance Evaluation of Spatio-Temporal Selectivity Estimation Techniques." In Proc. of the 15th International Conference on Scientific and Statistical Database Management (SSDBM), pp. 202-211, Cambridge, Massachusetts, USA, June 2003.
35. Joni Alon, Stan Sclaroff, George Kollios, and Vladimir Pavlovic. "Discovering Clusters in Motion Time-Series Data." In Proc. of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), pp. 375-381, Madison, Wisconsin, USA, July 2003.
36. Michail Vlachos, Carlotta Domeniconi, Dimitrios Gunopulos, George Kollios, and Nick Koudas. "Non-Linear Dimensionality Reduction Techniques for Classification and Visualization." In Proc. of the 8th ACM International Conference on Knowledge Discovery and Data Mining (SIGKDD), pp. 645-651, Edmonton, Canada, August 2002.
37. Marios Hadjieleftheriou, George Kollios, Vassilis Tsotras, and Dimitrios Gunopulos. "Efficient Indexing of Spatio-Temporal Objects." In Proc. of the International Conference on Extending Database Technology (EDBT), pp. 251-268, Prague, March 2002.
38. Michail Vlachos, George Kollios, and Dimitrios Gunopulos. "Discovering Similar Multi-dimensional Trajectories." In Proc. of the 18th IEEE International Conference on Data Engineering (ICDE), pp. 673-684, San Jose, February 2002.
39. George Kollios, Dimitrios Gunopulos, Nick Koudas, and Stefan Berchtold. "An Efficient Approximation Scheme for Data Mining Tasks." In Proc. of the 17th IEEE International Conference on Data Engineering, Heidelberg (ICDE), pp. 453-462, Germany, April 2001.
40. Dimitrios Gunopulos, George Kollios, Vassilis Tsotras, and Carlotta Domeniconi. "Approximating Multi-Dimensional Aggregate Range Queries Over Real Attributes." In Proc. of the 19th ACM International Conference on Management of Data (SIGMOD), pp. 463-474, Dallas, Texas, USA, June 2000.
41. George Kollios, Dimitrios Gunopulos, and Vassilis Tsotras. "On Indexing Mobile Objects." In Proc. of the 18th ACM Symposium on Principles of Database Systems (PODS), pp. 261-272, Philadelphia, Pennsylvania, USA, June 1999.

42. Joseph Hellerstein, Lisa Hellerstein, and George Kollios. "On the Generation of 2-Dimensional Index Workloads." In Proc. of the 7th International Conference on Database Theory (ICDT), pp. 113-130, Jerusalem, Israel, January 1999.

## Publications in Refereed Journals

1. Tomasz Nykiel, Michalis Potamias, Chaitanya Mishra, George Kollios, and Nick Koudas. "Sharing Across Multiple MapReduce Jobs." *ACM TODS*, Vol. 39, No 2, Article 12, 2014.
2. George Kollios, Michalis Potamias, and Evimaria Terzi. "Clustering Large Probabilistic Graphs." *IEEE Transactions on Knowledge and Data Engineering*, Vol 25, No 2, pp. 325-336, February 2013.
3. Panagiotis Papapetrou, Gary Benson, and George Kollios. "Mining Poly-regions in DNA." *International Journal of Data Mining and Bioinformatics (IJDMB)*, Vol 6, No 4, pp. 406-428, 2012.
4. Panagiotis Papapetrou, Vassilis Athitsos, Michalis Potamias, George Kollios, Dimitrios Gunopulos. "Embedding-based Subsequence Matching in Time Series Databases." *ACM TODS*, Vol. 36, No 3, Article 17, August 2011.
5. Feifei Li, Marios Hadjieleftheriou, George Kollios, and Leonid Reyzin. "Authenticated Index Structures for Aggregation Queries." *ACM Transactions on Information and System Security (ACM TISSEC)*, Vol. 13, No 4, December, 2010.
6. Panagiotis Papapetrou, George Kollios, Stan Sclaroff, and Dimitrios Gunopulos. "Mining Frequent Arrangements of Temporal Intervals." *Knowledge and Information Systems* Vol. 21, No 2, pp. 133-171, November, 2009.
7. Ke Yi, Feifei Li, Graham Cormode, Marios Hadjieleftheriou, George Kollios, and Divesh Srivastava. "Small Synopses for Group-By Query Verification on Outsourced Data Streams." *ACM TODS*, Vol 34, No 3, Article 15, August 2009.
8. Vassil Kriakov, Alex Delis, and George Kollios. "Self-Tuning Management of Update-Intensive Multidimensional Data in Clusters of Workstations." *VLDB Journal*, Vol 18, No 3, pp. 739-764, June 2009.
9. Jeffrey Considine, Marios Hadjieleftheriou, Feifei Li, John Byers, and George Kollios. "Robust Approximate Aggregation in Sensor Data Management Systems." *ACM TODS*, Vol 34, No 1, Article 6, April 2009.
10. Yin Yang, Stavros Papadopoulos, Dimitris Papadias, and George Kollios. "Authenticated Indexing for Outsourced Spatial Databases." *VLDB Journal*, Vol 18, No 3, pp. 631-648, June 2009.
11. Ke Yi, Feifei Li, George Kollios, and Divesh Srivastava. "Efficient Processing of Top-k Queries in Uncertain Databases with x-Relations." *IEEE Transactions on Knowledge and Data Engineering*, Vol 20, No 12, pp. 1669-1682, December 2008.
12. Vassilis Athitsos, Jonathan Alon, Stan Sclaroff, and George Kollios. "BoostMap: An Embedding Method for Efficient Nearest Neighbor Retrieval." *IEEE PAMI*, Vol. 30, No. 1, pp. 89-104, January 2008.

13. Vassilis Athitsos, Marios Hadjieleftheriou, George Kollios, and Stan Sclaroff. “Query-Sensitive Embeddings.” *ACM TODS*, Vol. 32, No. 2, June 2007.
14. Jimeng Sun, Yufei Tao, Dimitris Papadias, and George Kollios. “Spatio-Temporal Join Selectivity.” *Information Systems*, Vol. 31, No. 8, pp. 793-813, December 2006.
15. Marios Hadjieleftheriou, George Kollios, Vassilis Tsotras, and Dimitrios Gunopulos. “Indexing Spatio-Temporal Archives.” *VLDB Journal*, Vol. 15, No. 2, pp. 143-164, June 2006.
16. Dimitrios Gunopulos, George Kollios, Vassilis Tsotras, and Carlotta Domeniconi. “Selectivity Estimators for Multi-Dimensional Range Queries Over Real Attributes.” *VLDB Journal*, Vol. 14, No. 2, pp. 137-154, April 2005.
17. George Kollios, Dimitris Papadopoulos, Dimitrios Gunopulos, and Vassilis Tsotras. “Indexing Mobile Objects Using Dual Transformations.” *VLDB Journal*, Vol. 14, No. 2, pp. 238-256, April 2005.
18. Michail Vlachos, George Kollios, and Dimitrios Gunopulos. “Elastic Translation Invariant Matching of Trajectories.” *Machine Learning Journal*, Vol. 58, No. 2, pp. 301-334, February 2005.
19. George Kollios, Dimitrios Gunopulos, Nick Koudas, and Stephan Berchtold. “Efficient Biased Sampling for Approximate Clustering and Outlier Detection in Large Datasets.” *IEEE Transactions on Knowledge and Data Engineering*, Vol 15, No. 5, pp. 1170-1187, September/October 2003.
20. George Kollios and Vassilis Tsotras. “Hashing Methods for Temporal Data.” *IEEE Transactions on Knowledge and Data Engineering*, Vol 14, No. 4, pp. 902-919, July/August 2002.
21. George Kollios, Dimitrios Gunopulos, Vassilis Tsotras, Alex Delis, and Marios Hadjieleftheriou. “Indexing Animated Objects Using Spatio-Temporal Access Methods.” *IEEE Transactions on Knowledge and Data Engineering*, Vol. 13, No. 5, pp. 758-777, September/October 2001.

## Publications in Refereed Workshops and Demos

1. Alexios Kotsifakos, Panagiotis Papapetrou, Jaakko Hollmen, Dimitrios Gunopulos, Vassilis Athitsos, and George Kollios. “Hum-a-song: A Subsequence Matching with Gaps-Range-Tolerances Query-By-Humming System.” PVLDB 2012, Istanbul, Turkey, August 2012. (Demo Paper.)
2. Panagiotis Papapetrou, Gary Benson, and George Kollios. “Discovering Frequent Poly-Regions in DNA Sequences.” In Proc. of the ICDM Workshop on Data Mining in Bioinformatics (DMB), Hong Kong, China, December 2006.
3. Panfeng Zhou, Betty Salzberg, Donghui Zhang, Gene Cooperman, and George Kollios. “Close Pair Queries in Moving Object Databases.” In Proc. of the 13th ACM International Workshop on Geographic Information Systems (GIS), Bremen, Germany, 2005.
4. Vassilis Athitsos, Joni Alon, Stan Sclaroff, and George Kollios. “Filtering Methods for Similarity-based Multimedia Retrieval.” In Proc. of the 7th International Workshop of the EU Network of Excellence DELOS on AUdio-Visual Content and Information Visualization in Digital Libraries (AVIVDiLib), 2005.

5. Michail Vlachos, Dimitrios Gunopulos, and George Kollios. “Robust Similarity Measures for Mobile Object Trajectories.” In Proc. of the 5th International Workshop on Mobility in Databases and Distributed Systems (MDDS), pp. 721-728, Aix-en-Provence, France, 2002.
6. Dimitris Papadopoulos, George Kollios, Dimitrios Gunopulos, and Vassilis Tsotras. “Indexing Mobile Objects on the Plane.” In Proc. of the 5th International Workshop on Mobility in Databases and Distributed Systems (MDDS), pp. 693-697, Aix-en-Provence, France, 2002.
7. George Kollios, Stan Sclaroff, and Margrit Betke. “Motion Mining: Discovering Spatio-Temporal Patterns in Databases of Human Motion.” In the ACM Workshop on Research Issues in Data Mining and Knowledge Discovery (DMKD), Santa Barbara, CA, May 2001.
8. George Kollios, Dimitrios Gunopulos, and Vassilis Tsotras. “Nearest Neighbor Queries in a Mobile Environment.” In Proc. of the 1st International Workshop on Spatio-Temporal Databases (STDBM), pp. 119-134, (LCNS 1678), Edinburgh, Scotland, 1999.
9. George Kollios, Dimitrios Gunopulos, and Vassilis Tsotras. “Indexing Animated Objects.” In Proc. of the 5th International Workshop on Multimedia Information Systems (MIS), pp. 28-33, Palm Springs Desert, CA, 1999.

## Book Chapters and Short Papers

1. Spiros Papadimitriou, Feifei Li, George Kollios, and Philip S. Yu. “Privacy Preservation on Time Series.” Book Chapter in “Privacy-Aware Knowledge Discovery: Novel Applications and New Techniques”, Edited by Francesco Bonchi and Elena Ferrari, 2010.
2. Ke Yi, Feifei Li, Divesh Srivastava, and George Kollios. “Efficient Processing of Top-k Queries in Uncertain Databases.” Poster paper in the Proc. of the 24th IEEE International Conference on Data Engineering (ICDE), Cancun, Mexico, April 2008.
3. Vassilis Athitsos, Joni Alon, Stan Sclaroff, and George Kollios. “Learning Embeddings for Fast Approximate Nearest Neighbor Retrieval.” In G. Shakhnarovich T. Darrell, P. Indyk and eds. P. Viola, editors, *Approximate Nearest Neighbor Techniques for Local Learning and Perception*, MIT Press 2005.
4. Marios Hadjieleftheriou, Vassil Kriakov, Yangui Tao, George Kollios, Alex Delis, and Vassilis Tsotras. “Spatio-Temporal Data Services in a Sharing-Nothing Environment.” In Proc. of the 16th International Conference on Scientific and Statistical Database Management (SSDBM), pp. 131-134, Santorini, Greece, 2004.
5. Dan Buzan, Stan Sclaroff and George Kollios. “Extraction and Clustering of Motion Trajectories in Video.” In Proc. of International Conference on Pattern Recognition (ICPR), pp. 521-524, Cambridge, UK, 2004.
6. Lifei Tan, Vassilis Tsotras, George Kollios, and Dimitrios Gunopulos. “Multidimensional Membership Queries for Temporal Databases.” In the 12th International Conference on Software Engineering and Knowledge Engineering (SEKE), Chicago, 2000.
7. Alex Delis, Vinay Kanitkar, and George Kollios. “Database Architectures.” Book Chapter in the *Encyclopedia of Electrical and Electronics Engineering*, John Wiley and Sons, Inc., 1999.

## Invited Papers

1. George Kollios, John Byers, Jeffrey Considine, Marios Hadjieleftheriou, and Feifei Li. “Robust Aggregation in Sensor Networks.” IEEE Data Engineering Bulletin, Vol. 28, No. 1, pp. 26-32, March 2005.
2. Dimitris Papadopoulos, George Kollios, Dimitrios Gunopulos, and Vassilis J. Tsotras. “Indexing Mobile Objects Using Duality Transforms.” IEEE Data Engineering Bulletin, Vol. 25, No. 2, pp. 18-24, June 2002.
3. Stan Sclaroff, George Kollios, Margrit Betke, and Romer Rosales. “Motion Mining.” In Proc. of the 2nd International Workshop on Multimedia Databases and Image Communication (MDIC), pp. 16-32, Italy, 2001.

## Patents

US Patent, 8112802, “Verification of outsourced data streams.”, issued February 7, 2012.

## Professional Activities

Associate Editor, ACM Transactions on Database Systems (TODS), January 2008-2015.  
Associate Editor, IEEE Transactions on Knowledge and Data Engineering, September 2005-December 2009.  
General Co-Chair, 11th International ACM Workshop on Data Engineering for Wireless and Mobile Access, 2012.  
Track Chair, ACM Conference on Information and Knowledge Management (CIKM), 2010.  
General Chair, International Symposium on Spatial and Temporal Databases (SSTD) 2007.  
Co-Chair, Program Committee, 4th International Workshop on Networking Meets Databases, NetDB, 2008.  
Co-organizer of the 1st International Workshop on Spatial and Spatio-temporal Data Mining 2006.  
Local Arrangements Chair, IEEE ICDE, Boston, Massachusetts, April 2004.  
Local Arrangements, SSDBM, Cambridge, Massachusetts, July 2003.  
Co-organizer of the NSF IDM Workshop, Cambridge, Massachusetts, October, 2004.  
Program Committee Member, VLDB, 2004, 2005, 2007, 2008, 2009, 2010, 2012, 2013, 2014, 2015, 2018.  
Program Committee Member, ACM SIGMOD, 2009, 2012, 2014, 2015, 2016, 2019, 2020, 2021, 2022, 2023.  
Program Committee Member, ACM SIGKDD, 2006, 2007, 2008, 2009, 2012, 2013, 2014.  
Program Committee Member, IEEE ICDE, 2003, 2005, 2008, 2009, 2010, 2011, 2012, 2015.  
Program Committee Member, ACM WSDM, 2014.  
Program Committee Member, EDBT, 2009.  
Program Committee Member, IEEE ICDM, 2004, 2005, 2006, 2008.  
Program Committee Member, ACM CIKM, 2002, 2005, 2006, 2009, 2010, 2014.  
Program Committee Member, ACM GIS 2006, 2010.  
Program Committee Member, SSTD, 2001, 2003, 2005, 2009, 2011, 2013.  
Program Committee Member, IEEE SSDBM, 2004, 2005, 2007, 2008, 2009, 2012, 2013.

Program Committee Member, MDM, 2002, 2003, 2004, 2007, 2009, 2010, 2011, 2012, 2013.  
Program Committee Member, SIAM SDM, 2012.  
Program Committee Member, ECML/PKDD, 2007.  
Program Committee Member, DASFAA, 2005.  
Program Committee Member, COMAD, 2008.  
Program Committee Member, PiLBA, 2008.  
Program Committee Member, ICML, 2004.  
Program Committee Member, TIME, 2005, 2006, 2009.  
Program Committee Member, EDBT Ph.D. Workshop, 2006.  
Program Committee Member, DMSN Workshop, 2004.  
Program Committee Member, MobiDE Workshop, 2003, 2010.

National Science Foundation Proposal Review Panelist, Information Technology Research (ITR) 2002.  
National Science Foundation Proposal Review Panelist, IIS Division 2003, 2005, 2007, 2009, 2010, 2011, 2018.  
Research Grants Council of Hong Kong (RGC), Proposal Reviewer, 2004, 2005, 2006.  
European Research Council (ERC), Proposal Reviewer, 2012.

Reviewer for (partial list): ACM Transactions on Database Systems, IEEE Transactions on Knowledge and Data Engineering, VLDB Journal, Data and Knowledge Engineering, Information Systems, ACM Journal of Computer and System Sciences, Knowledge and Information Systems.

Member of ACM and IEEE Computer Society.

## **Undergraduate and Graduate Teaching**

1. CS 460/660 (Spring 2001-2022). Introduction to Database Systems. Significantly revised this course in 2001.
2. CS 112 (Fall 2008, 2009, 2010, 2012) Introduction to Computer Science II (a.k.a. Data Structures and Basic Algorithms.)
3. CS 565 (Fall 2007). Data Mining.
4. CS 562 (Fall 2001-2019). Advanced Database Applications. Developed this new course in 2001.
5. CS 113 (Spring 2002). Introduction to Computer Science II with Intensive C++.
6. CS 591 (Fall 2000). Seminar in Databases.

## **Research Advising**

### **Post-Doc Advising**

- Vassilis Athitsos, October 2006 - May 2007.
- Marios Hadjieleftheriou, January 2005-August 2005.

### **Doctoral Advising**

- Feifei Li, “Query and Data Security in the Data Outsourcing Model”, PhD, Boston University, July 2007.

- Panagiotis Papapetrou, “Embedding-based Subsequence Matching in Large Sequence Databases”, PhD, Boston University, July 2009.
- Michalis Potamias, “Analyzing Large Probabilistic Graphs”, PhD, Boston University, July 2011.
- Haohan Zhu, “Sequence Queries on Temporal Graphs”, PhD, Boston University, May 2016.
- Xianrui Meng, “Privacy-Preserving Queries on Encrypted Databases”, PhD, Boston University, July 2016.
- Dmytro Bogatov, “Secure and Efficient Query Processing in Outsourced Databases”, PhD, Boston University, April 2022.
- Nathan Cordner, Topic: “Correlation Clustering Algorithms and Improvements”, expected May 2023.
- Lina Qiu, Topic: “Differential Oblivious Query Processing”, expected May 2024.

#### **Doctoral Thesis Examining Committee Member**

- Andrej Cvetkovski, “Graph Embeddings for Low-Stretch Greedy Routing”, Third Reader, May 2013.
- Ashwin Thangali, “Exploiting phonological constraints for handshape recognition in sign language video”, Committee Chair, April 2013.
- Chong Wang, “Modeling and Optimizing Content-oriented Networks”, Third Reader, October 2012.
- Konstantin Voevodski, “Clustering and Network Analysis with Biological Applications”, Committee Chair, April 2011.
- Vitaly Ablavsky, “Layers of Graphical Models for Tracking and Action-Recognition in Video”, Committee Chair, March 2011.
- Vassil Kriakov, “Adaptive Data Management Techniques in Modern Network Infrastructures”, NYU-Poly, Second Reader, July 2008.
- Hao Xu, “Efficient Non-disruptive Snapshots for an Object Storage System”, Brandeis University, Third Reader, December 2005.
- Jeffrey Considine, “Schedule-Oblivious Data Management”, Fourth Reader, December 2004.
- Gu-In Kwon, “Scalable Architectures For Multicast Content Distribution”, Fourth Reader, May 2004.
- John Isidoro, “Stochastic Mesh-Based Multiview Reconstruction”, Fourth Reader, March 2004.
- Romer Rosales, “Specialized Mappings Architecture with Applications to Vision-Based Estimation of Articulated Body Pose”, Fourth Reader, December 2001.
- Santiago M. Pericas-Geertsen, “XML-Fluent Mobile Agents”, Second reader, December 2001.

#### **Master’s Thesis, Advisor**

- Xuan Zhang, “Dynamic Access Control Mechanisms for Outsourced Databases”, May 2011.
- Ching Chang, “Characterizing and Exploiting Reference Locality in Data Streams”, May 2006.
- Yangui Tao, “Spatio-Temporal Data Services in a Shared-Nothing Environment”, January 2004.
- Bogdan Buricea, “Indexing Moving Points with a New Dual Transformation”, May 2002.

#### **Master’s Thesis, Examining Committee Member**

- Dihan Cheng, “On the Analysis of Group Steiner Problems and Applications”, May 2005.
- Xin Qi, “Network Positioning For On-Line Nearest Neighbor Search”, May 2005.
- Jason Ruel, “Tracking and Prediction of Tumor Movement in the Abdomen”, May 2003.

#### **Master’s Project, Advisor**

- David Blumstein, “Similarity Models for Trajectories”, May 2001.

- Hui Zhang, “Dimensionality Reduction Methods for Indexing Multi-dimensional Time Series”, May 2002.
- Jonathan Liperi, “Efficient Indexing of Dynamic Time Warping”, May 2003.
- Bill Rainford, “Parallel Indexing of Dynamic Time Warping”, May 2003.
- Greg Fletcher, “Indexing Spatio-temporal Objects”, May 2003.
- Haobing Wang, “Mining Association Rules in American Sign Language”, May 2003.
- Nicholas Russo, “Statistical Analysis of Non-Linear Dimensionality Techniques”, May 2003.
- Hui Zhang, “Implementation and Optimization of the p-Cluster Model”, May 2003.
- Andreas Kartawidjaja, “Efficient Implementation of Shape Matching and Object Recognition Using Shape Contexts”, May 2004.
- Hao Lu, “A Comparison of Different Sketch Techniques for Spatio-temporal Aggregation”, May 2004.
- Meghan Callahan, “Comparing Methods of Mining Partial Periodic Patterns in Multidimensional Time Series Databases”, May 2004.
- Yijun Wang, “Tracking Frequent Items Dynamically”, May 2004.
- Eisara Supavai, “Indexing Similar Trajectories Using MVP-trees”, May 2005.

## Departmental and University Service

Director of MS Admissions, 2021-2022.

Member, Faculty Search Committee, 2019-2020.

Member, Faculty Search Committee, 2018-2019.

Associate Chair, Department of Computer Science, 2016-2018.

Member, University Appointments, Promotion, and Tenure Committee (UAPT) 2015-2017.

Member, Faculty Search Committee, 2014-2015.

Director of Graduate Admissions, 2011-2013.

Chair, Faculty Search Committee, 2008-2009.

Member of the Natural Sciences Curriculum Committee, 2006-2008.

Director of Graduate Admissions, 2002 - 2006.

Member, Faculty Search Committee, 2004-2005.

Computer Science Colloquium Coordinator, 2001-2002.

Doctoral Written Examination Committee, 2002-present.

## Invited Lectures, Seminars, and Conference Talks

“Accessing Data While Preserving Privacy”

- Harvard University, 2019.

“Privacy Preserving Similarity Evaluation of Time Series Data”

- University of Science and Technology, Hong Kong, 2014.

“Privacy Preserving Similarity Evaluation of Time Series Data”

- University of Science and Technology, Hong Kong, 2014.

“Verification of Query Results and Access Control in Outsourced Databases”

- Applied Communication Sciences, Piscataway, New Jersey, December 2012 (part of SPAR IARPA)

site visit presentations.)

“Nearest Neighbors in Uncertain Graphs”

- National Technical University of Athens, 2011.

“Efficient Processing of Top-k Queries in Uncertain Databases”

- Yahoo!Research, Barcelona, Spain, 2009.

“Verification of Continuous Queries on Data Streams”

- Computer Science Colloquium, UMass, Lowell, MA, 2008.
- Athens Colloquium on Algorithms and Complexity, Athens, Greece, 2008.

“Query Authentication in Outsourced Database Systems”

- National Technical University of Athens, 2007.
- Hong Kong University, Hong Kong, 2006.
- University of Science and Technology, Hong Kong, 2006.

“The Max-Stable Sketch: Estimating Dominance Norms over Multiple Data Streams”

- National Technical University of Athens, Greece, 2006.

“Approximate Aggregation Techniques for Sensor Networks”

- Brown University, Computer Science Department, 2004.
- Hewlett-Packard, Cambridge Research Lab, 2003.

“Approximate Aggregation in Spatio-temporal Databases”

- Boston University, Geography Department, 2004.

“Similarity Models for Trajectories”

- Boston University, Computer Science Department, 2002.
- National Technical University of Greece, Electrical and Computer Engineering, 2002.

“An Efficient Approximation Scheme for Data Mining Tasks”

- 17th IEEE International Conference on Data Engineering, Heidelberg, Germany, 2001.
- University of California, Riverside, Department of Computer Science and Engineering, 2001.

“Approximating Multi-Dimensional Aggregate Range Queries Over Real Attributes”

- 19th ACM SIGMOD Intl. Conference on Management of Data, Dallas, TX, 2000.

“Access Methods for Spatio-temporal Databases”

- Northeastern University, Computer Science Department, 2000.
- University of Florida, Computer Science Department, 2000.
- University of California, Davis, Computer Science Department, 2000.
- University of California, Santa Cruz, Computer Science Department, 2000.
- Washington University, Saint Louis, Computer Science Department, 2000.
- Boston University, Computer Science Department, 2000.
- University of British Columbia, Computer Science Department, 2000.
- University of Massachusetts, Boston, Computer Science Department, 2000.
- Polytechnic University, Computer and Information Science Department, 2000.
- AT&T Labs, 2000.
- Bell Labs, Lucent, 2000.
- Telcordia Technologies, 2000.

“On Indexing Mobile Objects”

- Schloss Dagstuhl-Wadern, Germany, Seminar in Spatial and Temporal Databases, 1998.
- 18th ACM Symposium on Principles of Database Systems, PODS '99, Philadelphia, PA, 1999.

“On the Generation of 2-Dimensional Index Workloads”

- 7th International Conference on Database Theory, ICDT '99, Jerusalem, Israel, 1999.
- National Technical University of Greece, Electrical and Computer Engineering, 1999.