

# M. Tamer Özsu

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## SUMMARY

M. Tamer Özsu is a University Professor in David R. Cheriton School of Computer Science at the University of Waterloo where he holds a Cheriton Faculty Fellowship. He also holds a Distinguished Visiting Professor position at Tsinghua University. He was the Director of the Cheriton School of Computer Science from January 2007 to June 2010, and the Associate Dean of Research of the Faculty of Mathematics from January 2014 to June 2016. He holds a Ph.D. (1983) and an MS (1981) in Computer and Information Science from The Ohio State University, USA (1983) and a B.S. (1974) and M.S. (1978) in Industrial Engineering from the Middle East Technical University, Turkey (1974). Prior to joining University of Waterloo in 2000, he was with the University of Alberta, Department of Computing Science (1984–2000) where he served as the Acting Chair of the Department during 1994–1995. He has held visiting positions at GTE Laboratories (USA), INRIA Rocquencourt (France), GMD-IPSI, (Germany), University of Jyväskylä (Finland), Technical University of Darmstadt (Germany), University of Udine (Italy), University of Milano (Italy), ETH Zürich (Switzerland), and National University of Singapore.

Dr. Özsu's research is on data science focusing on data engineering. His research follows two threads: large-scale data distribution, and management of non-traditional data (i.e., non-relational data). Currently, his research focus is on graph data and RDF data. Previously his research focus was on object systems, image, video, XML data, and their management in a distributed environment.

He is a Fellow of the Royal Society of Canada, the American Association for the Advancement of Science (AAAS), the Association for Computing Machinery (ACM), and the Institute of Electrical and Electronics Engineers (IEEE). He is an elected member of the Science Academy of Turkey, and a member of Sigma Xi. He is the recipient of the IEEE Innovation in Societal Infrastructure Award (2022), CS-Can/Info-Can Lifetime Achievement Award (2018), ACM SIGMOD Test-of-Time Award (2015), the ACM SIGMOD Contributions Award (2006), and The Ohio State University College of Engineering Distinguished Alumnus Award (2008). He is the four-time recipient of the University of Waterloo Outstanding Performance Award (2004, 2009, 2014, 2019). He has held Cheriton Faculty Fellowships (2013–2016, 2018–2024), a University Research Chair position (2004–2011), and a Faculty Research Fellowship (2000–2003) at the University of Waterloo, and a McCalla Research Professorship (1993–1994) at the University of Alberta.

Dr. Özsu is the author/co-author of three books including the classic *Principles of Distributed Database Systems* (with Patrick Valduriez), which is now in its fourth edition. He has edited twelve books/proceedings including the *Encyclopedia of Database Systems* (with Ling Liu), now in its second edition. He has published over 190 journal and conference papers, one of which was recognized by a test-of-time award and two with best paper awards. A fourth was selected for best paper honourable mention.

He founded the book program of Association for Computing Machinery (ACM) and served as its Founding Editor-in-Chief (2014–2020). He was also the Founding Series Editor-in-Chief of Morgan & Claypool's Synthesis Lectures on Data Management (2009–2014). He serves on the editorial boards of ACM Transactions on Internet Technologies, World Wide Web Journal, and Springer Book Series on Advanced Information & Knowledge Processing and Web Information

Systems Engineering and Internet Technologies. He has served as the Program Chair of all three major database conferences: ACM SIGMOD (2014), IEEE ICDE (2007), and VLDB (2004), as well as of WISE (2001), IDEAS (2003), and CIKM (1996) conferences. He has been on the Program Committees of many conferences, symposia and workshops.

Dr. Özsu chairs the Steering/Advisory Committee of Polytechnic University of Hong Kong Research Centre on Data Science and AI, and serves on the Advisory Committee of Istanbul Technical University (Turkey) Artificial Intelligence and Data Science Application and Research Centre, Technical Advisory Committee of Tsinghua University (China) National Engineering Laboratory for Big Data Software, on the Advisory Boards of Hong Kong University of Science and Technology School of Engineering, and Hong Kong University of Science and Technology Big Data Institute.

He previously served on the CS-Can/Info-Can Board (2017–2020), on the Publications Board of Association for Computing Machinery (2002–2017), on the Scientific Advisory Board of National Institute of Informatics of Japan (2011–2017), and on the Technical Expert Advisory Committee of City University of Hong Kong Multimedia Software Engineering Research Center (2014–2019). He was the Chair of ACM Special Interest Group on Management of Data (SIGMOD) (2001–2005), an Editor-in-Chief of The VLDB Journal (1997–2005), an associate editor of ACM Computing Surveys (2005–2009), and a trustee of the VLDB Endowment (1996–2002). He served as the Canadian Association for Computer Science’s representative on Computing Research Association’s Board of Directors (2010–2013). He was a member and chair the Computer and Information Science Grant Selection Committee of the Natural Sciences and Engineering Research Council of Canada (1991–1994), and served on the Management Committee of the Canadian Genome Analysis and Technology Program (1992–1993).

PERSONAL

- ◇ **Birth place and date:** Turkey, 18 March 1951
- ◇ **Citizenship:** Canadian & Turkish
- ◇ **Marital status:** Married, one son, one grandson

EDUCATION

- ◇ **The Ohio State University**, Columbus, Ohio, USA  
Ph.D., Computer and Information Science, 1983
- ◇ **The Ohio State University**, Columbus, Ohio, USA  
M.S., Computer and Information Science, 1981
- ◇ **Middle East Technical University**, Ankara, Turkey  
M.Sc., Industrial Engineering, 1978
- ◇ **Middle East Technical University**, Ankara, Turkey  
B.Sc., Industrial Engineering, 1974

AWARDS &  
HONOURS

- ◇ **Major Awards**
  - IEEE Innovation in Societal Infrastructure Award, 2022  
For “contributions to data science infrastructure and distributed data management”
  - Distinguished Visiting Professor, Tsinghua University, China, 2020
  - ◇ CS-Can/Info-Can Lifetime Achievement Award, 2018
  - ◇ University Professor, University of Waterloo, 2018  
For “exceptional scholarly achievement and international pre-eminence”
  - Ohio State University College of Engineering Distinguished Alumnus Award, 2008
  - ACM SIGMOD (Special Interest Group on Management of Data) Contributions Award, 2006  
For “long-standing dedicated service to the database research community, including leadership roles in the SIGMOD and VLDB organizations, and innovations in the publication process”

◇ **Fellowships**

- American Association for the Advancement of Science (AAAS), 2018
- Royal Society of Canada, 2016
- The Science Academy, Turkey, 2013
- Institute of Electrical and Electronics Engineers (IEEE), 2011  
For “contributions to distributed data management and multimedia database systems”
- Association for Computing Machinery (ACM), 2006  
For “contributions to distributed data management and service to the database community”

◇ **Publication Awards**

- ◇ ACM SIGMOD Test-of-Time Award 2015 that recognizes “the best paper from the SIGMOD proceedings 10 years prior, based on the criterion of identifying the paper that has had the most impact (research, products, methodology) over the intervening decade” for paper
  - L. Chen, M. T. Özsu, and V. Oria. “Robust and Fast Similarity Search for Moving Object Trajectories,” In *Proc. ACM SIGMOD International Conference on Management of Data*, 2005, pages 491–502.
- ◇ Best Paper Award, 44th International Conference on Very Large Data Bases, 2018 for paper
  - Siddhartha Sahu, Amine Mhedhbi, Semih Salihoglu, Jimmy Lin, and M. Tamer Özsu. “The ubiquity of large graphs and surprising challenges of graph processing,” *Proc. VLDB Endowment*, 11(4): 420–431, 2018.
- ◇ Best Paper Award, 23rd International Conference on Database Systems for Advanced Applications, 2018 for paper
  - Peng Peng, Lei Zou, M. Tamer Özsu, and Dongyan Zhao. “Multi-Query optimization in Federated RDF Systems,” In *Proc. 23rd International Conference on Database Systems for Advanced Applications*, 2018, pages 745–765.
- ◇ Best Paper Award Honourable Mention (one of the three best papers at the conference), 29th International Conference on Data Engineering, 2013 for paper
  - C. Balkesen, J. Teubner, G. Alonso, and M. T. Özsu. “Main-Memory Hash Joins on Multi-Core CPUs: Tuning to the Underlying Hardware,” In *Proc. 29th IEEE International Conference on Data Engineering*, 2013, pages 362–373.

◇ **Other Awards**

- University of Waterloo Cheriton Faculty Fellow, 2013–2016, 2018–2021
- University of Waterloo University Research Chair, 2004–2011
- University of Waterloo Outstanding Performance Award, 2004, 2009, 2014, 2019
- Natural Sciences and Engineering Research Council (NSERC) of Canada Accelerator Award for Exceptional Opportunity, 2013
- ACM Distinguished Lecturer, 2007
- IBM CAS Canada Research Faculty Fellow, 2010–present
- Faculty of Mathematics Fellow, University of Waterloo, 2000–2003
- McCalla Professor, University of Alberta, 1993–1994
- Sigma Xi–Scientific Research Society Member
- NATO Ph.D. scholarship, through TÜBİTAK–The Scientific and Technical Research Council of Turkey, 1979–1983

RESEARCH  
INTERESTS

My research is broadly on data engineering aspects of data science with two foci:

- ◇ **Application of database technology to non-traditional data types**

Data types I have studied include multimedia data, temporal data, time series data, spatial data, XML, streaming data, graph data, RDF data (the last two are the ones that I currently investigate).

◇ **Distributed/parallel data management of the above data types**

Most recent work addresses streaming data and distributed XML processing. Current work focuses on distributed/parallel graph management and processing algorithms.

EMPLOYMENT

- ◇ **2020–present:** Tsinghua University, China  
Distinguished Visiting Professor
- ◇ **2018–present:** University of Waterloo, Canada  
University Professor
- ◇ **July 2000–2018:** University of Waterloo, Canada  
Professor of Computer Science
- ◇ **July 2000–June 2005:** University of Alberta  
Adjunct Professor
- ◇ **July 1993–June 2000:** University of Alberta, Canada  
Professor of Computing Science
- ◇ **July 1989–June 1993:** University of Alberta, Canada  
Associate Professor of Computing Science
- ◇ **July 1984–June 1989:** University of Alberta, Canada  
Assistant Professor of Computing Science
- ◇ **March 1983–July 1984:** Independent Computer Consultant specializing on database systems and information system design.
- ◇ **September 1981–March 1983:** Ohio State University, Columbus, OH  
Graduate Teaching Associate (taught introductory computing courses)
- ◇ **January 1981–September 1981:** Ohio State University, Columbus, OH  
Graduate Research Associate
- ◇ **March 1979–January 1980:** Technicare, Inc., Solon, Ohio, USA  
Part-Time Programmer/Analyst (developed and implemented a software simulator for the CT Scanners that the company used to build)
- ◇ **June 1977–January 1979:** TÜMOSAN Turkish Motor Industries and Trade Corp., Ankara, Turkey  
Industrial Engineer/Systems Analyst at R&D Department
- ◇ **March 1976–June 1977:** In-plant Training Centre for Engineers, a joint project of UNIDO (United Nations Industrial Development Organization) and Turkish Ministry of Industry and Technology.  
Industrial Engineering and System Analysis Expert
- ◇ **1975–March 1976:** Postal, Telephone and Telegraph (PTT) Administration, Ankara, Turkey  
Industrial Engineer, Electronic Data Processing Dept.

SENIOR  
ADMINISTRATIVE  
POSITIONS

- ◇ **2018/07–present:** Director, Waterloo-Huawei Joint Innovation Lab, University of Waterloo
- ◇ **2014/01–2016/06:** Associate Dean of Research, Faculty of Mathematics, University of Waterloo
- ◇ **2007/01– 2010/06:** Director, David R. Cheriton School of Computer Science, University of Waterloo
- ◇ **1994/07–1995/06:** Acting Chair, Department of Computing Science, University of Alberta

VISITING  
POSITIONS

- ◇ **2011/09–2011/03:** Visiting Professor, ETH Zürich, Department of Computer Science, Switzerland
- ◇ **2010/08–2011/03:** KITHCT Visiting Professor, National University of Singapore, School of Computing, Singapore

- ◇ **2006/09–2006/12:** Visiting Professor, National University of Singapore, School of Computing, Singapore
- ◇ **2006/03–2006/06:** Visiting Professor, ETH Zürich, Department of Computer Science, Switzerland
- ◇ **2005/04–2005/05:** Visiting Professor, National University of Singapore, School of Computing, Singapore
- ◇ **1998/05:** Visiting Professor, University of Milano, Italy
- ◇ **1998/01–1998/03:** Visiting Scientist, GMD-IPSI, Darmstadt, Germany
- ◇ **1997/09–1997/12:** Visiting Scientist, INRIA Rocquencourt, Le Chesnay, France
- ◇ **1990/07–1991/06:** Visiting Scientist, GTE Laboratories, Waltham, MA, USA

TEACHING  
EXPERIENCE

- ◇ **Undergraduate Courses:**
  - Principles of Data Management and Use (University of Waterloo)
  - Distributed Systems (University of Waterloo)
  - Introduction to Database Management (University of Waterloo)
  - Computer Applications in Business Databases (University of Waterloo)
  - Introduction to File and Database Systems (University of Alberta)
  - Database Management Systems (University of Alberta)
  - Telecommunications and Computers (University of Alberta)
  - Modeling and Analysis of Computer Systems (University of Alberta)
  - Switching Theory and Logical Design (University of Alberta)
  - Elements of Programming I (University of Alberta)
  - Introduction to Business Computing (University of Alberta)
  - Programming and Algorithms I (The Ohio State University)
  - Introduction to Programming (The Ohio State University)
  - Management Information Systems (Middle East Technical University, Turkey)
  - Database Systems (Middle East Technical University, Turkey)
- ◇ **Graduate Courses**
  - Principles of Data Management and Use (University of Waterloo—online course)
  - Big Data Computing Platforms (University of Waterloo)
  - Modern Database Systems (University of Waterloo)
  - Parallel and Distributed Database Systems (University of Waterloo)
  - System and Network Architectures and Implementation (University of Waterloo)
  - Parallel and Distributed Databases (National University of Singapore)
  - Parallel and Distributed Databases (ETH Zürich)
  - Internet-Scale Distributed Data Management (University of Waterloo)
  - Web Data Management (University of Waterloo)
  - Distributed Database Systems (University of Waterloo & University of Alberta)
  - Advanced Computer Architectures (University of Alberta)

PROFESSIONAL  
ACTIVITIES

- ◇ **Advisory Boards**
  - Chair, Advisory/Steering Committee, Polytechnic University of Hong Kong Research Centre on Data Science and AI, 2021–present.

- Member, Advisory Council, Istanbul Technical University Artificial Intelligence and Data Science Application and Research Centre, 2020–present.
- Member, Advisory Council, Huawei Distributed Scheduling and Data Engine Lab, Markham, Canada, 2018–present.
- Member & Chair, Advisory Board, Hong Kong University of Science and Technology, Department of Computer Science and Engineering, 2009–2012, 2014–2017 & 2020–2023.
- Member, Advisory Board, Hong Kong University of Science and Technology Big Data Institute, 2017–present (<http://www.cse.ust.hk/BDI/>)
- Member, Technical Advisory Board, Tsinghua University National Engineering Laboratory for Big Data Software, 2017–present
- Member, International Advisory Board, National Institute of Informatics (NII), Tokyo, Japan, 2011–2017 (<http://www.nii.ac.jp/en/>).
- Member, Advisory Board, Hong Kong University of Science and Technology, School of Engineering, 2009–2014 & 2017–2020.
- Member, Technical Expert Advisory Committee, City University of Hong Kong Multimedia Software Engineering Research Center, 2014-2019 (<http://www.cityu.edu.hk/merc/>).

◊ **Professional Societies**

- Member of the Board, CS-Can/Info-Can, 2017–2020 (<http://cscan-infocan.ca>)
- Computing Research Association (CRA) Board Member, Canadian Association of Computer Science (CACCS/AIC) Representative, 2009–2013.
- ACM Publications Board Member, 2002–2017.
- ACM SIGMOD Advisory Board Member, 2015–2017.
- Proceedings of VLDB Advisory Board Member, 2014–present.
- ACM Special Interest Group on Data Management–SIGMOD Chair (<http://www.sigmod.org>), 2001–2005.
- VLDB Endowment Trustee (<http://www.vldb.org>), 1996–2002.
- International Federation for Cooperative Information Systems Board Member, 1999–2002.

◊ **Program Reviews**

- Carleton University Data Science and Analytics Graduate Program, 2020.
- INRIA (France) Data and Knowledge Representation and Processing Theme, 2019.
- Hong Kong University of Science and Technology, School of Engineering, 2018, 2013.
- Hong Kong University of Science and Technology, Department of Computer Engineering, 2014.
- University of British Columbia Department of Computer Science, 2010.
- University of California, Santa Barbara, Computer Science Department, 2001.
- York University, Department of Computer Science, 2001.

◊ **Others**

- Member, CRA Committee on Scholarly Practices in Computing, 2013–2014.  
See report at [http://cra.org/resources/bp-view/best\\_practices\\_memo\\_evaluating\\_scholarship\\_in\\_hiring\\_tenure\\_and\\_promot/](http://cra.org/resources/bp-view/best_practices_memo_evaluating_scholarship_in_hiring_tenure_and_promot/)
- Major Project Leader & Member of Programme Committee, Canadian Institute for Telecommunications Research, 1998–2000.
- Founding Board Member, Edmonton New Media, 1996–1997.
- Founding Director, Research Institute for Multimedia Systems, University of Alberta, 1996–1997.

- Member and Chair of the Grant Selection Committee, Natural Sciences & Engineering Research Council of Canada (<http://www.nserc.ca>), 1991–1994.
- Member of the Management Committee, Canadian Genome Analysis & Technology Program, 1992–1993.

SCIENTIFIC  
ACTIVITIES

◊ **Book Series:**

- Founding Editor-in-Chief, *ACM Book Series*, ACM, 2013–2019.  
Series home page: <http://books.acm.org>
- Founding Series Editor, *Synthesis Lectures on Data Management*, Morgan & Claypool, 2009–2013.  
Series home page: <http://www.morganclaypool.com/toc/dtm/1/1>.  
Published 38 books
- Co-Editor-in-Chief, *Encyclopedia of Database Systems, 2nd edition*, Springer, 2019.
- Editorial Board Member, *Web Information Systems Engineering and Internet Technologies*, Springer (2005–present).
- Editorial Board Member, *Advanced Information and Knowledge Processing*, Springer (2002–2013).

◊ **Journal Activities:**

- Associate Editor, *ACM Transactions on Internet Technologies*, ACM, 2019–present.
- Editorial Board Member, *World Wide Web Journal - Internet and Web Information Systems*, Springer, 2001–present.
- Editorial Board Member, *Frontiers of Computer Science*, 2018–present.
- Editorial Board Member, *FACETS*, 2018–present.
- Editorial Board Member, *Knowledge and Information Systems*, 2003–2018.
- Advisory Board Member, *International Journal for Next-Generation Computing*, 2011–present.
- Associate Editor, *Proceedings of VLDB Endowment*, 2018–2020.
- Review Board Member, *Proceedings of VLDB Endowment*, 2011–2015, 2015–2016, 2021.
- Editorial Board Member, *Journal of Information and Data Management*, Brazilian Computer Society, 2010–2013.
- Senior Advisory Board Member, *ACM Journal on Data and Information Quality*, ACM, 2007–2013.
- Editorial Board Member, *Information Technology and Management*, Springer, 1997–2013.
- Editorial Board Member, *Distributed and Parallel Databases*, Springer, 1993–2012.
- Associate Editor, *ACM Computing Surveys*, 2005–2010.
- Editor-in-Chief, *The VLDB Journal*, VLDB Endowment/Springer, 1997–2005. Between 2001–2005: Coordinating Editor-in-Chief.
- Editorial Board Member, *SIGMOD DiSC (Digital Symposium Collection)*, ACM SIGMOD, 1998–2001.
- Editorial Board Member, *SIGMOD Digital Review*, ACM SIGMOD, 1999–2001.
- Editorial Board Member, *The VLDB Journal*, VLDB Endowment/Springer, 1994–1997.
- Editorial Board Member, *Parallel and Distributed Technology: Systems and Applications*, IEEE Computer Society, 1992–1996. Title later changed to *Concurrency*.
- Guest Editor (with Qing Li), Special issue on Web Media Information Systems, *World Wide Web Journal*, 5(3), 2002.

- Guest Editor (with Stavros Christodoulakis), Special issue on Multimedia Data Management, *The VLDB Journal*, 8(1), 1999.
- Guest Editor (with Elisa Bertino), Special issue on Distributed/Parallel Object Management, *Distributed and Parallel Databases—An International Journal*, 2(1), 1994.
- Guest Editor, *INFOR*, 26(4), 1988 and 27(2), 1989.
- Guest Editor, *Canadian Information Processing*, July/August 1992.

◇ **Conference/Symposia/Workshop Activities:**

*General Chair/Co-Chair:*

- *35th IEEE International Conference on Management of Data (ICDE): 2019.*
- *APWeb-WAIM Joint Conference on Web and Big Data: 2017.*
- *18th Asia-Pacific Web Conference (APWeb): 2016.*
- *7th International Conference on Web Information Systems Engineering (WISE): 2006.*
- *14th Conference on Advanced Information Systems Engineering (CAiSE): 2002.*
- *International Workshop on Issues and Applications of Database Technology (IADT): 1998.*
- *International Conference on Computing and Information: 1998.*
- *International Workshop on Distributed Object Management: 1992.*

*Program Committee Chair/Co-Chair:*

- *The 8th IEEE International Conference on Big Knowledge (ICBK): 2017.*
- *ACM SIGMOD International Conference on Management of Data (SIGMOD): 2014.*
- *International Conference on Very Large Data Bases (VLDB): 2004.*
- *International Conference on Data Engineering (ICDE): 2007, 2001 (Industrial Program Co-PC Chair).*
- *ACM SIGMOD/PODS PhD Symposium: 2012.*
- *International Workshop on Graph Databases (IWDG): 2010.*
- *International Workshop on Semantic Web and Databases (SWDB): 2006.*
- *International Database Engineering & Applications Symposium (IDEAS): 2002.*
- *2nd International Conference on Web Information Systems Engineering (WISE): 2001.*
- *Fourth International Workshop on Multimedia Information Systems (MIS): 1998.*
- *Fifth International Conference on Information and Knowledge Management (CIKM): 1996.*
- *Fifth International Workshop on Research Issues in Data Engineering: Distributed Object Management (RIDE-DOM): 1995.*
- *CIPS (Canadian Information Processing Society) Edmonton Conference: 1987.*

*Program Committee Vice-Chair/Area Chair or Senior PC Member:*

- *ACM SIGMOD International Conference on Management of Data: 2013, 2019, 2020, 2021.*
- *IEEE International Conference on Data Engineering, 2021, 2022.*
- *International Conference on Extending Database Technology, 2021, 2022.*
- *ACM International Conference on Information and Knowledge Management: 2015, 2016, 2017.*
- *IEEE International Conference on Distributed Computing Systems: 1992, 1996.*
- *IEEE International Conference on Data Engineering: 1993, 2003, 2006, 2011.*
- *Workshop on Parallel and Distributed Database Systems (as part of EURO-PAR): 1997.*

*Program Committee Member:*



- *International Conference on Very Large Data Bases (VLDB)*: 1992, 1993, 1995, 1997, 1999, 2002, 2009, 2010.
- *ACM International Conference on Management of Data (SIGMOD)*: 1994, 1996, 1999, 2007, 2008, 2009, 2010, 2016, 2017, 2018.
- *IEEE International Conference on Data Engineering (ICDE)*: 1991, 1996, 1997, 1999, 2000, 2002, 2004, 2012, 2015, 2016.
- *ACM Symposium on Cloud Computing (SOCC)*: 2020.
- *International Conference on Extending Database Technology (EDBT)*: 2006, 2008, 2009.
- *International Conference on Similarity Search and Applications (SISAP)*: 2016
- *International World Wide Web Conference (WWW)*: 2007.
- *International Conference on Principles of Distributed Systems (OPODIS)*: 2014.
- *IEEE International Conference on Big Data*: 2014.
- *International Conference on Big Data and Smart Computing (BigData)*: 2015.
- *IEEE International Conference on Multimedia Computing and Systems (ICMCS)*: 1996, 1997, 1999.
- *Database Management and Application over Networks (DBMAN)*: 2007.
- *International Workshop on End-to-End Management of Big Data*: 2012.
- *IEEE International Conference on Data Mining (ICDM)*: 2001.
- *ACM International Conference on Knowledge and Data Discovery (KDD)*: 2001.
- *Conference on Advanced Information Systems Engineering (CAiSE)*: 2003
- *International Conference on Web Information Systems Engineering (WISE)*: 2005.
- *International Conference on Information and Knowledge Management (CIKM)*: 1995, 1998, 2012 (Senior Program Committee), 2013.
- *International Conference on Cooperative and Interoperable Information Systems (CoopIS)*: 1998, 2000, 2001.
- *International Conference on Database Systems for Advanced Applications (DASFAA)*: 2005.
- *International Conference on Distributed Computing Systems (ICDCS)*: 1993, 1994, 1998, 2002, 2006.
- *ACM/IFIP/USENIX 7th International Middleware Conference (Middleware)*: 2006, 2007.
- *Fourth International XML Database Symposium (XSym)*: 2006.
- *International Workshop on Research Issues in Data Engineering (RIDE)*: 1993, 1996, 1997, 1998, 1999, 2001, 2002.
- *Third International Workshop on Networks Meets Databases (NetDB)*: 2007.
- *IEEE Workshop on Information & Software as Services (WISS)*: 2009, 2010.
- *European Conference on Object Oriented Programming (ECOOP)*: 2000.
- *International Workshop on Database Technologies for Handling XML Information on the Web*: 2006.
- *2nd International Workshop on Information Quality in Information Systems*: 2005.
- *Brazilian Symposium on Databases (SBBD)*: 2004, 2005, 2006, 2007.
- *International Symposium on Computer and Information Sciences (ISCIS)*, 2004, 2005, 2007.
- *IFIP 2.6 Working Conference on Data on Semantics Issues in Multimedia Semantics (DS)*: 1999, 2001.
- *International Workshop on Persistent Object Systems (POS)*: 1994, 1998, 2000.

- *IFIP 2.6 Working Conference on Visual Database Systems (VDB)*: 1998, 2000.
- *International Symposium (formerly Workshop) on Temporal Representation and Reasoning (TIME)*: 2001.
- *Third International Symposium on Cooperative Database Systems for Advanced Applications (CODAS)*: 2001.
- *International Conference on Advances in Visual Interfaces (AVI)*: 2000.
- *International Symposium on Distributed Object and Applications (DOA)*: 1999, 2000.
- *International Conference on Applications of Databases (ADB)*: 1994, 1995.
- *International Conference on Parallel and Distributed Information Systems (PDIS)*: 1994.
- *International Conference on Computer Communications and Networks*: 1995, 1996.
- *International Workshop on Multimedia Information Systems (MIS)*: 1999, 2001, 2005.
- *International Workshop on Interacting with Databases (IDA)*: 2000.
- *IBM CASCON Conference*: 1998.
- *IEEE Knowledge and Data Engineering Exchange Workshop*: 1997.
- *International Conference on Management of Data*: 1994. (India)
- *International Symposium on Applied Corporate Computing*: 1993, 1994. (Mexico)
- *International Symposium on Object-Oriented Methodologies and Systems*: 1994. (Italy)
- *International Conference on Parallel and Distributed Systems*: 1993. (Taiwan)
- *The International Workshop on Next Generation Information Technologies and Systems (NGITS)*: 1993. (Israel)
- *International Conference on Computing and Information*: 1992.
- *Symposium on Applied Computing (SAC)*: 1993.
- *CIPS (Canadian Information Processing Society) National Congress*: 1989.
- *CIPS Edmonton Conference*: 1986, 1988.

*Others:*

- Best Paper Selection Committee Chair, *ACM SIGMOD International Conference on Management of Data*: 2013.
- Honorary Chair, *International Conference on Very Large Data Bases*: 2012.
- Ten-Year Best Paper Award Committee Chair, *International Conference on Very Large Data Bases*: 2010.
- Tutorials Committee, *ACM International Conference on Databases*: 2009.
- Tutorial Chair, *International Conference on Very Large Data Bases*: 1997.
- Tutorial Chair, *IEEE International Conference on Data Engineering*: 1998.
- Tutorial Chair, *International Symposium on Databases in Parallel and Distributed Systems*: 1988.
- Co-organizer, *Dagstuhl Workshop on Data Quality on the Web*, Dagstuhl, Germany, September 2003.
- Panel Organizer, *Web Information Systems Engineering*, 14th International Conference on Advanced Information Systems Engineering (CAiSE), 2002.
- Advanced Technology Seminars Chair, *IEEE International Conference On Data Engineering (ICDE)*, 2002.
- Panel Organizer, *Data Management Issues in Electronic Commerce*, ACM International Conference on Management of Data (SIGMOD), 1999.

- Co-organizer, *Dagstuhl Workshop on Database Support for Digital Libraries*, Dagstuhl, Germany, August 1999.
- Co-organizer, *NATO Advanced Systems Institute on Workflow Systems and Interoperability*, Istanbul, Turkey, 12-20 August, 1997.
- Steering Committee Member, *International Workshop on Temporal Databases: 1995*.
- Co-organizer, *NATO Advanced Systems Institute on Object-Oriented Database Systems*, Kusadasi, Turkey, 6-17 August, 1993.
- Organizing Committee Member, *International Workshop on an Infrastructure for Temporal Databases: 1993*.
- Demos Chair, *ACM SIGMOD/PODS Conference: 1997*.
- Organizing Chair, *18th International Conference on Very Large Data Bases: 1992*.
- Publicity Chair, *ACM SIGMOD/PODS Conference: 1996; VLDB Conference: 1998; International Conference on Distributed Information Systems: 1991; 8th ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing: 1989*.
- Advisory Committee Member of the Software Technology Track, *28th Hawaii International Conference on System Sciences: 1995*.
- Steering Committee Member, *4th International Conference on Computing and Information: 1993*.
- Coordinator, Issues in Distributed Databases Session, *Hawaii International Conference on System Sciences: 1986, 1987*.

◇ **Grant Review Activities**

- Natural Sciences and Research Council of Canada.
- National Science Foundation, USA.
- Austrian Science Foundation (FWF).
- Hong Kong Research Grants Council (RGC).
- Norwegian Research Program.
- Swiss National Science Foundation.
- Icelandic Research Fund.
- Portuguese Foundation for Science and Technology.

UNIVERSITY  
SERVICE

Unless otherwise noted, all responsibilities after 2000 are at the University of Waterloo; earlier ones are at the University of Alberta.

◇ **University and Faculty Level Committees**

**2020–2022:** Member, Waterloo Institute for Sustainable Energy Internal Board of Management

**2018–present:** Member, Faculty of Mathematics Data Science Program Committee

**2017–present:** Member, Honorary Degrees Committee, Faculty of Mathematics

**2019–2020:** Member, Faculty of Mathematics Dean Nominating Committee

**2019–2020:** Member, Cheriton School of Computer Science Director Nominating Committee

**2015/06–2016/06:** Interim Chair, *Bibliometrics Working Group*

**2014/01–2016/06:** Associate Dean of Research, *Faculty of Mathematics*

**2014/01–2016/06:** Member, *Senate Graduate and Research Committee*

**2009–2010:** Member, *Review Committee for Renewal of Waterloo Institute for Health Informatics Research*

**2005–2006:** Member, *Nominating Committee for Director of School of Computer Science*

**2003–2004:** Member, *Faculty of Mathematics Dean Selection Committee;*

- 2001–2002:** Member, *Nominating Committee for Chair of Department of Computer Science*
- 2000–2001:** Chair, *Ad hoc Committee on Department Governance* (The Committee, formed jointly by the Dean of Mathematics and the Chair of Computer Science, proposed a new model of governance for Computer Science that included recommendations for substantially changing the organization and operation of both Computer Science and the Faculty of Mathematics); Member, *Ad hoc Committee on Departmental Reorganization* (This is a precursor to the Committee on Governance; it was also struck jointly by the Dean of Mathematics and the Chair of Computer Science with the mandate of surveying the Department of Computer Science and determining the governance-related issues); Member, *Department of Computer Science Representative to Math Faculty Computing Facility Advisory Committee*
- 1998–1999:** Member, *Technology Enhanced Instructional Spaces Advisory Committee* (A university committee that plans and budgets for the establishment of new and renewal of existing instructional computer laboratories); Member, *Faculty of Science–Information Technology Committee*
- 1996:** Faculty of Science representative on the *Committee on Space Planning*
- 1995:** Member, *General Appeals Committee* (This is a standing committee of the Academic Vice-President. office dealing with appeals by faculty members of their annual evaluations. I was an ad hoc member for one case)
- 1995–1997:** Member, *Faculty of Science Research Award Selection Committee*
- 1995–1996:** Member, *Faculty of Science Selection Committee for the Gordin Kaplan Award for Excellence in Research*
- 1994–1996:** Member and Chair (1995–96), *McCalla Professor Selection Committee*, Faculty of Science
- ◇ **School/Department Level Committees**
- 2012–2014:** Member, *Advisory Committee on Appointments*; Member, *Graduate Recruiting Committee*
- 2007/01–2010/06:** Director, David R. Cheriton School of Computer Science
- 2006–2007:** Member, *Tenure and Promotion Committee*
- 2005–2006:** Member, *Tenure and Promotion Committee*; Chair, *Undergraduate Recruiting Committee*
- 2003–2004:** Member, *Advisory Committee on Appointments*
- 2002–2003:** Member, *Advisory Committee on Appointments*
- 2001–2002:** Member, *Graduate Committee*; Member, *Infrastructure Committee*; Member, *Advisory Committee on Appointments*
- 1998–1999:** Chair, *Computing Resources Policy Committee*; Member, *Recruiting Committee*; Member, *Executive Committee*
- 1994/07–1995/06:** Acting Chair, Department of Computing Science
- 1993–1994:** Member of *Department of Computing Science Chair Selection Committee*
- 1991–1993:** Chair, *Research Planning and External Affairs Committee*
- 1988–1990:** Member, *Executive Committee*; Chair, *Graduate Committee*
- 1985–1988:** Member, *Executive Committee*; Member, *Graduate Committee*
- 1986–1988:** Member, *Computing Resources Policy Committee*

STUDENTS &  
RESEARCH  
PERSONNEL

◇ **Current PhD Students:**

- Khaled Ammar (Fall 2011–present), Parallel Analytics over Dynamic Graphs.
- Zeynep Korkmaz (Winter 2013–present), Caching Techniques for Efficient Query Execution over Property Graphs.

- Anıl Paçacı (Fall 2015–present), Streaming Graph Processing at Scale.
- Aida Sheshbolouki (Fall 2017–present), Machine Learning Techniques in Streaming Graph Analytics.

◇ **Current MMath Students:**

- None

◇ **Post-Doctoral Fellows and Research Associates:**

- Dr. Himchan Park (March 2021–present)

◇ **Graduated PhD Students:**

16. *Güneş Aluç*

**Thesis title:** Scalable, Adaptive, and Distributed RDF Data Management

**Graduation date:** Fall 2015

**Current affiliation:** SAP Canada, Waterloo, Canada

15. *Patrick Kling*

**Thesis title:** Distributed XML Query Processing

**Graduation date:** Spring 2012

**Current affiliation:** Google, Waterloo, Canada

14. *Dr. Yingying Tao*

**Thesis title:** Mining Time-Changing Data Streams

**Graduation date:** Spring 2012

**Current affiliation:** CI Investments Inc., Toronto, Canada

13. *Dr. Qiang Wang*

**Thesis title:** Efficient Range and Join Query Processing in Massively Distributed Peer-to-Peer Networks

**Graduation date:** Fall 2008

**Current affiliation:** Oracle Corp., Seattle, WA, USA

12. *Dr. Ning Zhang*

**Thesis title:** XQuery Evaluation and Optimization: A Native Approach

**Graduation date:** Fall 2006

**Current affiliation:** Facebook, CA, USA

11. *Dr. Lukasz Golab*

**Thesis title:** Processing Continuous Queries over On-line Data Streams

**Graduation date:** Fall 2006

**Current affiliation:** Associate Professor of Management Science, University of Waterloo, Waterloo, Canada

Winner of Alumni Gold Medal

10. *Dr. Lei Chen*

**Thesis title:** Similarity Search Over Time Series and Trajectory Data

**Graduation date:** Spring 2005

**Current affiliation:** Professor of Computer Science at Hong Kong University of Science and Technology, Hong Kong.

9. *Dr. Kaladhar Voruganti*

**Thesis title:** Studies on Client Caching DBMS Architectures and Algorithms

**Graduation date:** Spring 2001

**Current affiliation:** VP, Technology Innovation, Equinix, Redwood City, CA, USA  
Co-supervised with Ron Unrau

8. *Dr. Lingling Yan*

**Thesis title:** Building Scalable and Flexible Mediation: The AURORA Approach

**Graduation date:** Spring 2000

**Current affiliation:** Director, Product Management, Dataguisse, Fremont, CA, USA

7. *Dr. Yuri Leontiev*  
**Thesis title:** Type System for an Object-Oriented Database Programming Language  
**Graduation date:** Fall 1999  
**Current affiliation:** Electronic Arts, Edmonton, Canada  
Winner of 1999 Governor General Award and 2001 NSERC Doctoral Dissertation Award  
Co-supervised with Duane Szafron
  6. *Dr. Iqbal Gorawalla*  
**Thesis title:** Temporal Aspects and Rule Systems in Object-Oriented Database Systems  
**Graduation date:** Spring 1998  
**Current affiliation:** Principal Consultant at Triton Consulting, UK.  
Co-supervised with Duane Szafron
  5. *Dr. John Z. Li*  
**Thesis title:** Query Languages for Multimedia Database Systems and their Optimization  
**Graduation date:** Spring 1998  
**Current affiliation:** Accenture Ltd, Mississauga, Ontario, Canada  
Co-supervised with Duane Szafron
  4. *Dr. Randal Peters*  
**Thesis title:** Formal Models, Views and Languages for Object-Oriented Database Systems  
**Graduation date:** Spring 1994  
**Current affiliation:** Instructor at Red River College and Director of IT, Sherpa (EMS) Ltd.,  
Winnipeg, Canada
  3. *Dr. Dave D. Straube*  
**Thesis title:** Queries and Query Processing in Object Oriented Database Systems  
**Graduation date:** Spring 1991  
**Current affiliation:** Retired.
  2. *Dr. Kenneth Barker*  
**Thesis title:** Transaction Management in Multidatabase Systems  
**Graduation date:** Fall 1990  
**Current affiliation:** Professor of Computer Science, University of Calgary, Calgary, Canada
  1. *Dr. Abdel A. Farrag*  
**Thesis title:** Concurrency and Consistency in Database Systems  
**Graduation date:** Spring 1986  
**Current affiliation:** Professor of Computer Science, Dalhousie University, Halifax, Canada.
- ◇ **Graduated Master's Students:**
37. *Libo Gao*  
**Thesis title:** Streaming WatDiv –A Streaming RDF Benchmark  
**Graduation date:** Spring 2018  
**Last known affiliation:** Wish, Toronto, Canada
  36. *Yan Zhang*  
**Thesis title:** Efficient Structure-Aware Query Processing over Large Property Graphs  
**Graduation date:** Spring 2018 **Last known affiliation:** IBM Toronto Laboratories,  
Markham, Canada
  35. *Ning Zhang*  
Non-thesis master's  
**Graduation date:** Fall 2014  
**Last known affiliation:** Google, Kitchener, Canada
  34. *Yuke Yang*  
**Thesis title:** ViewDF: a Flexible Framework for Incremental View Maintenance in Stream  
Data Warehouses  
**Graduation date:** Fall 2013  
**Last known affiliation:** Kobo Inc., Toronto, Canada

33. *Xin Zhan*  
**Essay title:** Survey on Energy Efficient Computing  
**Graduation date:** Spring 2010  
**Last known affiliation:** RBC Capital Markets, Toronto, Canada
32. *Amod Gupta*  
**Thesis title:** Audio Processing on Constrained Devices  
**Graduation date:** Spring 2010  
**Last known affiliation:** Microsoft Corp., Redmond, WA, USA
31. *Jack Ng*  
**Essay title:** Extending Progressive Optimization to a Shared-Nothing Parallel Database Architecture  
**Graduation date:** Spring 2007  
**Last known affiliation:** Huawei Technologies, Markham, Canada
30. *Emre Cem Özgen*  
**Thesis title:** View Selection in XML Query Processing  
**Graduation date:** Fall 2006  
**Last known affiliation:** Salesforce, CA, USA
29. *Sam Lightstone*  
**Thesis title:** Automated Design of Multi-Dimensional Clustering Tables for Relational Databases  
**Graduation date:** Spring 2004  
**Last known affiliation:** IBM Toronto Laboratories, Markham, Canada
28. *Mohammad Hossain Sheikh Attar*  
**Thesis title:** Alternative Architectures and Protocols for Providing Strong Consistency in Dynamic Web Applications  
**Graduation date:** Spring 2004  
**Last known affiliation:** unknown
27. *Weimin Li*  
**Thesis title:** XComp: An XML Compression Tool  
**Graduation date:** Fall 2003  
**Last known affiliation:** Economic Insurance Group, Waterloo, Canada.
26. *Catalin Visinescu*  
**Thesis title:** Incremental Data Distribution on Internet-Based Distributed Systems: A Spring System Approach  
**Graduation date:** Fall 2003  
**Last known affiliation:** Blackberry, Waterloo, Canada.
25. *Sunny K.S. Lam*  
**Thesis title:** WebQA: A Web Querying Using the QA Approach  
**Graduation date:** Spring 2002  
**Last known affiliation:** Oracle Canada, Toronto, Canada.
24. *Yuxin (Leon) Cao*  
**Thesis title:** The Evaluation of Strong Web Caching Consistency Algorithms  
**Graduation date:** Spring 2002  
**Last known affiliation:** unknown
23. *Shu Lin*  
**Thesis title:** An Extendible Hashing Structure for Image Similarity Searches  
**Graduation date:** Fall 2000  
**Last known affiliation:** Huawei Technologies, Markham, Canada
22. *Justin Amalraj*  
**Thesis title:** Performance Evaluation of Optimistic Cache Consistency Algorithms for Web-based Electronic Commerce Applications

**Graduation date:** Fall 2000

**Last known affiliation:** unknown

21. *Benjamin Bin Yao*

**Thesis title:** Building an Interoperable Distributed Image Database Management System on top of a CORBA Platform

**Graduation date:** Fall 2000

**Last known affiliation:** Microsoft Asia, Beijing, China

20. *Bing Xu*

**Thesis title:** Design and Development of a Visual Query Interface for DISIMA Image DBMS

**Graduation date:** Spring 2000

**Last known affiliation:** IBM Canada, Toronto, Canada

19. *Irene Lin-Oi Cheng*

**Thesis title:** Image Databases: A Content-Based Type System and Query by Similarity Match

**Graduation date:** Spring 1999

**Last known affiliation:** Scientific Director, Multimedia Research Centre, University of Alberta

18. *Adriana Zubiri (Manas)*

**Thesis title:** Design and Implementation of an Object Database for Injury Surveillance

**Graduation date:** Fall 1997

**Last known affiliation:** IBM Toronto Laboratories, Markham, Canada.

17. *Sherine El-Medani*

**Thesis title:** Coupling an SGML Compiler With a Multimedia Database Management System

**Graduation date:** Fall 1996

**Last known affiliation:** Siemens, Ottawa, Canada

Co-supervised with Duane Szafron

16. *Manuela Junghaans (Schone)*

**Thesis title:** A Generic Type System for Object-Oriented Multimedia Databases

**Graduation date:** Fall 1996

**Last known affiliation:** Siemens AG, Berlin, Germany

Co-supervised with Duane Szafron

15. *Ghada El-Medani*

**Thesis title:** A Visual Query Facility for Multimedia Databases

**Graduation date:** Fall 1995

**Last known affiliation:** unknown

Co-supervised with Duane Szafron

14. *Chiradeep Vittal*

**Thesis title:** Design and Implementation of an Object-Oriented Multimedia Database System for News-on-Demand

**Graduation date:** Fall 1995

**Last known affiliation:** ONI Systems, San Jose, CA, USA

Co-supervised with Duane Szafron

13. *Adriana Munoz*

**Thesis title:** An Extensible Query Optimizer Architecture for the TIGUKAT Objectbase Management System

**Graduation date:** Spring 1994

**Last known affiliation:** PhD Student, University of Ottawa, Canada

12. *Kaladhar Voruganti*

**Thesis title:** Benchmarking for new database application domains



- Graduation date:** Spring 1993  
**Last known affiliation:** See above under Former PhD students  
Essay-based master's
11. *Yun Wang*  
**Thesis title:** Advanced Transaction Models and Management Strategies for Object-Oriented Database Systems  
**Graduation date:** Spring 1993  
**Last known affiliation:** Destiny Software, Wishohocken, Pennsylvania, USA  
Essay-based master's
  10. *Ana Dominguez*  
**Thesis title:** A Query Optimization Strategy for Multidatabase Systems  
**Graduation date:** Fall 1993  
**Last known affiliation:** PrePrint Inc., Edmonton, Canada.
  9. *Boman B. Irani*  
**Thesis title:** Implementation of TIGUKAT Object Model  
**Graduation date:** Fall 1993  
**Last known affiliation:** Sun Microsystems, Palo Alto, CA, USA
  8. *Anna P. Lipka*  
**Thesis title:** The Design and Implementation of TIGUKAT User Languages  
**Graduation date:** Fall 1993  
**Last known affiliation:** Alias-Wavefront, Toronto, Ontario, Canada.
  7. *Youping Niu*  
**Thesis title:** Network Communication Overhead in Distributed Concurrency Control Performance  
**Graduation date:** Fall 1990  
**Last known affiliation:** unknown
  6. *Yan Li*  
**Thesis title:** Communication in FLEX  
**Graduation date:** Spring 1990  
**Last known affiliation:** unknown
  5. *Meei Fen Teo*  
**Thesis title:** Experiments on the Implementation of Database Buffer Management Strategies in Virtual Memory Environments  
**Graduation date:** Spring 1989  
**Last known affiliation:** unknown
  4. *Kok-Lung Wong*  
**Thesis title:** Distributed Simulation of Performance Petri Nets  
**Graduation date:** Fall 1988  
**Last known affiliation:** unknown
  3. *David Meechan*  
**Thesis title:** A Heuristic Approach to Query Processing  
**Graduation date:** Spring 1988  
**Last known affiliation:** Zim Technologies International, Barbados
  2. *Christina Lau*  
**Thesis title:** Object Management, Protection and Scheduling in FLEX  
**Graduation date:** Spring 1988  
**Last known affiliation:** IBM Laboratories, Markham, Canada
  1. *Tse-Men Koon*  
**Thesis title:** Performance of Resilient Synchronization Mechanisms for Distributed Databases  
**Graduation date:** Spring 1986  
**Last known affiliation:** unknown

◇ **Former Post-Doctoral Fellows and Research Associates:**

- Dr. Himchan Park, March 2021–March 2021). Degree from Korea Advanced Institute of Science and Technology, KÖrea.
- Dr. Guoqing Xiao, October 2017–October 2019). Degree from Hunan University, China. Associate Professor in Computer Science and Technology, Hunan University, China.
- Dr. Bojana Bislimovska, October 2015–September 2018. Degree from Politecnico di Milano, Italy. SAP Canada, Waterloo, Canada.
- Dr. Xiaofei Zhang, December 2015–September 2018. Degree from Hong Kong University of Science and Technology. Assistant Professor, Department of Computer Science, University of Memphis, USA.
- Dr. Olaf Hartig, November 2012–November 2014. Degree from Humboldt Universität zu Berlin, Germany. Associate Professor (Docent), Department of Computer and Information Science, Linköping University, Sweden.
- Dr. Reza Akbarania, December 2007–December 2008. Degree from Université de Nantes, France. Research Scientist at INRIA Sophia Antipolis - Méditerranée Research Center, Lirmm Laboratory, Université de Montpellier, France.
- Dr. Susanne Busse, July–September 2007, Degree from Technische Universität Berlin. Professor at Fachhochschule Brandenburg, Fachbereich Informatik und Medien.
- Dr. Vincent Oria, University of Alberta, May 1996–December 1999. Degree from Ecole Nationale Supérieure des Télécommunications, France. Professor of Computer Science at New Jersey Institute of Technology, Newark, NJ, USA.
- Paul Iglinski, University of Alberta. January 1995–July 2000. Retired from University of Alberta.

◇ **Former Visiting Students:**

- Yuedan Chen, PhD student at Hunan University, China, October 2018–October 2019 (graduation date: 2020).
- Youhuan Li, PhD student at Peking University, China, September 2016–April 2017. Currently Assistant Professor, Hunan University, China.
- Bojana Bislimovska, PhD student at Politecnico di Milano, Italy, June–September 2012 and June–September 2013.
- Tao Chen, PhD student at National University of Defense Technology, China, October 2009–March 2011 (graduation date: 2011). Currently researcher at Beijing Proteome Research Center, Beijing Institute of Radiation Medicine, China.
- Lei Zou, PhD student at Huazhong University of Science and Technology, China, September 2008–October 2009 (graduation date: 2009). Currently Professor, Institute of Computer Science & Technology, Peking University, China.
- Raymond Wong, PhD student at Chinese University of Hong Kong, June–July 2008 (graduation date: 2008). Currently Assistant Professor, Department of Computer Science, Hong Kong University of Science and Technology, Hong Kong.
- Nan Tang, PhD student at Chinese University of Hong Kong, March - August 2007 (graduation date: 2008). Currently Researcher at Qatar Computing Research Institute, Qatar.
- Yueguo Chen, PhD student at National University of Singapore, April - June 2007 (graduation date: 2009). Currently Associate Professor, Department of Computer Science, Renmin University, China.
- Xiaoyan Yang, PhD student at National University of Singapore, April - June 2007 (graduation date: 2012). Currently Researcher at Advanced Digital Sciences Center, Singapore.
- Sebastian Schär, Master's student at Dresden University of Technology, Germany, 2004.
- Abdullah Diltemiz, Master's student at RWTH Aachen, Germany, 2003–2004.

- Sule Gündüz-Öğüdücü, PhD student at Istanbul Technical University, Turkey, 2001-2002 (graduation date: 2003). Currently Associate Professor, Department of Computer Engineering, Istanbul Technical University, Turkey.
- Henrike Berthold, PhD student at Dresden University of Technology, Germany, 2000 (graduation date: 2002)
- Sylvia Hollfelder, PhD student at Technical University of Darmstadt, Germany, 1999 (graduation date: 2004)
- Katherine Gayer, Master's student at Technical University of Darmstadt, Germany, 1996.

◊ **Undergraduate Interns:**

- Baran Gayretli, Sabanci University, Turkey, Summer 2019.
- Kerem Akillioglu, Sabanci University, Turkey, Summer 2018.
- Boshen Cui, University of Waterloo, Fall 2017.
- Runsheng Guo, University of Waterloo, Fall 2017.
- Vincent Luong, University of Waterloo, Spring 2017.
- Anzo Zhao Yang Teh, University of Waterloo, Spring 2017.
- Heli Wang, University of Waterloo, Spring 2017.
- Anselme Goetschmann, University of Waterloo, Spring 2017.
- Weiyang Zhu, University of Waterloo, Spring 2017.
- Zhuoran Yu, University of Waterloo, Spring & Fall 2017.
- Amod Gupta, Indian Institute of Information Technology, Allahabad, India, Spring 2006.
- Kumar Gaurav Bijay, Indian Institute of Technology, Bombay, India, 2005.
- Abhay Kumar Jha, Indian Institute of Technology, Bombay, India, Spring 2005.
- Piyush Prahladka, Indian Institute of Technology, Bombay, India, Spring 2004.
- Shishir K. Agrawal, Indian Institute of Technology, Bombay, India, Spring 2004.
- Varun Kochalia, Indian Institute of Technology, Bombay, India, Spring 2003.
- Shaveen Garg, Indian Institute of Technology, Bombay, India, Spring 2003.
- Shariq Rizvi, Indian Institute of Technology, Bombay, India, Spring 2002.
- Nitin Khendelwal, Indian Institute of Technology, Bombay, India, Spring 2002.
- Andreas Doms, Dresden University of Technology, Germany, 2001-2002.
- Mirko Seifert, Dresden University of Technology, Germany, 2001-2002.
- Bilal Shirazi, University of Waterloo, Spring 2002.
- Aameek Singh, Indian Institute of Technology, Bombay, India, Spring 2001.

◊ **External Examiner:**

- Misha Genkin, PhD Committee, Carleton University; March 2021.
- Priyanka Vashisht, Thapar University, India, 2017 (PhD).
- Vincent Leroy, University of Grenoble, France 2017 (Rapporteur for Habilitation à Diriger les Recherches).
- Sairam Gurajada, Saarland University, Germany, 2017 (PhD).
- Sobhan Badiozamani, University of Uppsala, Sweden, 2016 (PhD)
- Stamatis Zampetakis, Université Paris-Sud and Inria-Saclay, France, 2015 (PhD)
- Le Thuy Ngoc, National University of Singapore, 2014 (PhD)
- Laurent Amsaleg, Université de Rennes 1, France, 2014 (Rapporteur for Habilitation à Diriger les Recherches)

- Cagri Balkesen, ETH Zürich, Switzerland, 2014 (PhD)
- Erietta Liarou, Universiteit van Amsterdam, The Netherlands, 2013 (PhD)
- Alexandru Maga, ETH Zürich, Switzerland, 2011 (PhD)
- Sadegh Nobari, National University of Singapore, 2012 (PhD)
- Michael Duller, ETH Zürich, Switzerland, 2011 (PhD)
- Huayu Wu, National University of Singapore, 2011 (PhD)
- Irina Magdalena Botan, ETH Zürich, Switzerland, 2011 (PhD)
- Liang Xu, National University of Singapore, 2010 (PhD)
- Ladjel Bellatreche, Université de Poitiers, France, 2009, (Rapporteur for Habilitation à Diriger les Rescherches)
- Haifeng Liu, University of Toronto, Canada, 2009 (PhD)
- Nan Tang, Chinese University of Hong Kong, Hong Kong, 2008 (PhD)
- Eric Lo, ETH Zürich, Switzerland, 2007 (PhD)
- Christian Plattner, ETH Zürich, Switzerland, 2006 (PhD)
- Changqing Li, National University of Singapore, 2006 (PhD)
- Attila Barta, University of Toronto, Canada 2006 (PhD)
- Thomas Heimrich, Technical University of Ilmenau, Germany, 2005 (PhD)
- Timour Katchaounov, University of Uppsala, Sweden, 2003 (PhD)
- Henrique Paques, Georgia Institute of Technology, USA, 2003 (PhD)
- Andrea Cali, Università di Roma La Sapienza. Italy, 2002 (PhD)
- Henrike Berthold, Dresden University of Technology, Germany, 2002 (PhD)
- Ioana Manolescu, Université de Versailles, France, 2001(PhD; Rapporteur)
- Eleana Kafeza, Hong Kong University of Science and Technology, Hong Kong, 2000 (PhD)
- Alban Gabillon, Université de Toulon, France, 2000 (Rapporteur for Habilitation à Diriger les Rescherches)
- Mikael Ronström, University of Linköping, Sweden, 1998 (PhD)
- Jacek Skowronek, University of Twente, The Netherlands, 1997 (PhD)
- Panagiotis Patsouris, University of Witwatersrand, South Africa, 1997 (PhD)
- Gopi Attaluri, University of Waterloo, Canada, 1996 (PhD)
- Li Yu, University of Western Ontario, Canada, 1992 (PhD)
- Vinay Deshpande, University of Waterloo, Canada, 1991 (PhD)
- Bjorn Bergsten, Université Paris 6, France, 1991 (PhD)

RESEARCH &  
OTHER FUNDING

Total of about \$15M. Unless otherwise noted, all of the following are in Canadian Dollars. NSERC grants are net without overhead. In most of these, I am the PI; the few where I am not the PI are marked by †.

- ◇ Scaling-Out Streaming Graph Processing Graph Processing, NSERC Collaborative Research Grant, 2019-2022, \$94,200/year.
- ◇ Highly Scalable Graph Processing, NSERC Discovery Grant, 2019-2024, \$41,000/year.
- ◇ Streaming Graph Processing at Scale, Waterloo-Huawei Joint Innovation Laboratory, 2018-2021, \$75,000/year.
- ◇ Canadian Workshop on Data Science, NSERC CONNECT Grant, 2018, \$23,600.

- ◇ Scaling the Cluster Computing Infrastructure for Scalable Big Data Management and Analysis. Canada Foundation for Innovation Infrastructure Operating Fund, 2017–2022, \$39,000 (joint with Ian Munro and Khuzaima Daudjee).
- ◇ Approximate Graph Query Answering over Streaming Microblogs, NSERC Collaborative Research and Development Grant, 2016-2017, \$76,545. Matches the Google Faculty Research Award.
- ◇ Scaling the Cluster Computing Infrastructure for Scalable Big Data Management and Analysis. Canada Foundation for Innovation and Ontario Research Fund, 2016, \$264,050 (joint with Ian Munro and Khuzaima Daudjee).
- ◇ Approximate Query Answering over Streaming Microblogs Using Graph Models. Google Faculty Research Award, 2015, US\$39,000.
- ◇ RDF Data Management. NSERC Discovery Grant, 2014-2019, \$54,000/year.
- ◇ NSERC Accelerator Grant, 2014-2017, \$40,000/year.
- ◇ Cluster Computing Infrastructure for Scalable Big Data Management and Analysis. Canada Foundation for Innovation and Ontario Research Fund, 2013, \$538,536 (joint with Ian Munro and Khuzaima Daudjee).
- ◇ Techniques and Systems for Parallel Graph Analysis. IBM Centre for Advanced Studies, 2013-2015, \$28,000/year.
- ◇ Focusing on the Data in Web-Scale Data Integration. Business Intelligence NSERC Strategic Network, 2012-2013, \$25,000 (joint with Ashraf Abounaga).
- ◇ Modeling and Querying Uncertainty in Record De-duplication and Repairing FD Violations. Business Intelligence NSERC Strategic Network, 2012-2013, \$25,000 (joint with Ihab Ilyas).
- ◇ Modeling and Querying Uncertainty in Record De-duplication. Business Intelligence NSERC Strategic Network, 2011-2012, \$52,000 (joint with Ihab Ilyas).
- ◇ Multi-Platform Digital Media Enabling Technologies. Ontario Research Fund, 2010-2017, \$4,899,045.
- ◇ Beyond Mashups: Data Integration for End-Users. Google Faculty Research Award, 2009, US\$70,000.
- ◇ Studies in Advanced Distributed Data Management. NSERC Discovery Grant, 2009-2014, \$70,000/year.
- ◇ Distributed XML Processing. Business Intelligence NSERC Strategic Network, 2009-2011, \$37,500 (joint with Denilson Barbosa, University of Alberta).
- ◇ Keyword-enabling Data Warehouses†. Business Intelligence NSERC Strategic Network, 2009-2011, \$44,000/year (joint with Ihab Ilyas, University of Waterloo and Laks Lakshmanan, UBC).
- ◇ Change Detecting and Mining of Dynamic Data Streams. IBM Centre for Advanced Studies, 2009-2011, \$28,000/year.
- ◇ Data Stream Management in Sensor Networks. Communications and Information Technology Ontario (CITO) Grant, 2005-2007, \$125,821.
- ◇ Data Stream Systems. Sun Microsystems Grant, 2004-2005, \$40,000.
- ◇ Internet-based Data Management Issues. NSERC Discovery Grant, 2004-2008, \$65,700/year.
- ◇ Database Technology in IP Telephony†. Communications and Information Technology Ontario, 2003-2005, \$118,500/year (including \$30,000 from Nortel; joint with Grant Weddell and David Toman).
- ◇ The Software Telecommunications Group (STG). 2002-2007, Ontario Research and Development Challenge Fund (ORDCF): \$4,730,000 (including \$2,480,000 from Nortel and \$300,000 from Sun Microsystems); Co-PIs: Ric Holt, M. Tamer Özsu, Johnny Wong.

- ◇ Issues in Developing Next Generation Distributed Database Systems. NSERC Individual Research Grant, 1999-2004, \$38,000/year.
- ◇ Managing Large, Diverse Data Sources†. Bell University Laboratories Grant, 2000-2002, \$225,000/year (with 8 others; Frank Tompa as PI).
- ◇ Equipment for Database Systems Research†. NSERC Equipment Grant, 2001, \$56,970 (with 7 others; Ken Salem as PI).
- ◇ *Enabling Technologies for Electronic Commerce Major Project*: Funding for two projects: Development of Multimedia Virtual Catalogs and Interoperability Issues in Electronic Commerce. 1998-1999: \$76,500, 1999-2002: \$61,000/year; Project Integration and Management. 1998-2001: \$61,000/year. This major project was part of the Canadian Institute for Telecommunications Research (CITR), one of the Canadian Networks of Centres of Excellence.
- ◇ Distributed Image Databases. Institute for Robotics and Intelligent Systems (IRIS), one of the Canadian Networks of Centres of Excellence, 1998–1999: \$30,000/year; 1999–2005: \$20,000/year.
- ◇ CAVE Virtual Reality†. Natural Sciences and Engineering Research Council of Canada (NSERC) Major Installation Grant, 1998, \$433,000 (PI: Mark Green).
- ◇ Design and Implementation of an Enactment Service for a Workflow System (PI: Mark Green). NATO Collaborative Research Grant, 1997–1998, Belgian Francs 204,000 (with Asuman Dogac of Middle East Technical University as PI).
- ◇ A Distributed Image Database Management System. Natural Sciences and Engineering Research Council of Canada (NSERC) Strategic Grant, 1995–1999, \$327,620.
- ◇ Electronic Commerce. Part of the Broadband Services Major Project of Canadian Institute for Telecommunications Research (CITR), one of the Canadian Networks of Centres of Excellence, 1996–1998, \$100,000/year.
- ◇ Design and Implementation of Distributed Objectbase Management Systems. Natural Sciences and Engineering Research Council of Canada (NSERC) Research Grant, 1995–1999, \$30,900/year.
- ◇ Multimedia Data Management. as part of the Broadband Services Major Project of Canadian Institute for Telecommunications Research (CITR), one of the Canadian Networks of Centres of Excellence, 1993–1998, \$437,875.
- ◇ Upgrade to the Laboratory for Database Systems Research. Natural Sciences and Engineering Research Council of Canada (NSERC) Equipment Grant, 1993–1994, \$38,500.
- ◇ Artificial Intelligence–Database Systems Group Infrastructure Grant†. Natural Sciences and Engineering Research Council of Canada (NSERC), 1994–1997, \$33,000/year (with 8 others).
- ◇ Design and Implementation of Distributed Object-Oriented Database Systems. Natural Sciences and Engineering Research Council of Canada (NSERC) Operating Grant, 1991–1994, \$28,000/year.
- ◇ Visit of Researcher Patrick Valduriez. 1991–1992, Operating Grant, University of Alberta Central Research Fund, \$5,000.
- ◇ Laboratory for Database Systems Research. Natural Sciences and Engineering Research Council of Canada (NSERC) Equipment Grant, 1990–1991, \$43,397 (with three other applicants).
- ◇ Artificial Intelligence–Database Systems Group Infrastructure Grant†. Natural Sciences and Engineering Research Council of Canada (NSERC), 1991–1993, \$45,000/year (with 25 other applicants).
- ◇ CPU Server†. Natural Sciences and Engineering Research Council of Canada (NSERC) Major Equipment Grant, 1990, \$194,530 (with 25 other applicants).
- ◇ Design and Implementation of DIDOS: A Distributed Database Operating System. Natural Sciences and Engineering Research Council of Canada (NSERC) Operating Grant, 1988–1991, \$19,477/year.

- ◇ Visit to Institute for System Studies, Moscow, U.S.S.R., June 18–July 2, 1988, Travel Grant, University of Alberta Central Research Fund, \$1,700.
- ◇ Interfacing Distributed Databases with Operating Systems. Natural Sciences and Engineering Research Council of Canada (NSERC) Operating Grant, 1987–1988, \$14,000.
- ◇ Analysis and Design of Distributed Database Systems/Operating System Support for Distributed Databases. Natural Sciences and Engineering Research Council of Canada (NSERC) Operating Grant, 1986–1987, \$13,797.
- ◇ Attendance at the 19th Hawaii International Conference on System Sciences. January 1986, Travel Grant, University of Alberta Central Research Fund, \$1,000.
- ◇ Analysis and Design of Distributed Database Systems. Natural Sciences and Engineering Research Council of Canada (NSERC) Operating Grant, 1985–1986, \$13,140.
- ◇ Distributed Computing Group Infrastructure Grant†, Natural Sciences and Engineering Research Council of Canada (NSERC), 1985–1986, \$69,000 (with 13 other applicants).
- ◇ A Net Simulator for Distributed Database Systems. University of Alberta Central Research Fund, 1984–1985, \$8,000.

CONSULTING &  
EXTERNAL  
SEMINARS

◇ **Industrial Consulting:**

BlueCat Networks, Toronto, Canada (2011)

Consulted on patent infringement issues.

Pre Print Inc., Edmonton, Canada (1996)

PrePrint develops software for the creation of yellow page directories. The assignment included providing assistance for distribution design of the database that is used for this application.

Bull Information Systems, Phoenix, USA (1993)

Consultancy in distributed database management. A major portion of the consulting involved a three-day intensive (18 hours) course on this topic for 80 engineers.

◇ **Seminars and Tutorials at Conferences:**

Linked Data Query Processing (with Olaf Hartig). *30th IEEE International Conference on Data Engineering*, April 2014, Chicago, Illinois (1.5 hours).

Distributed Data and Object Management. *International Conference on Extended Database Technology*, March 1996, Avignon, France (half-day).

Distributed Data and Object Management. *Fourth International Conference on Information and Knowledge Management*, November 29–December 2 1995, Baltimore, MD, USA (half-day).

Transactions and Transaction Management in Object-Oriented Database Systems. *NATO Advanced Study Institute on Object-Oriented Database Systems*, August 6–15, 1993, Kusadasi, Turkey (half-day).

Distributed Data Management–Unsolved Problems and New Issues. *9th International Conference on Data Engineering*, April 19–23, 1993, Vienna, Austria (half-day).

Distributed Object Management. *1st International Conference on Information and Knowledge Management*, November 5–7, 1992, Baltimore, MD, USA (half-day).

Distributed Data Management–Unsolved Problems and New Issues. *8th International Conference on Data Engineering*, February 3–7, 1992, Tempe, AZ, USA (full-day).

Distributed Databases within the Enterprise. *CIPS (Canadian Information Processing Society) Edmonton .1 Conference*, October 21–24, 1991, Edmonton, Canada (half-day).

Distributed Data Management–Unsolved Problems and New Issues. *17th International Conference on Very Large Data Bases*, September 3–6, 1991, Barcelona, Spain (half-day).

Operating System Support for Distributed Database Systems: Architectures and Issues in Integration. *The 2nd IEEE Symposium on Parallel and Distributed Processing*, December 9 – 13, 1990, Dallas, TX, USA (full day).

Distributed Database Management Systems. *6th International Conference on Data Engineering*, February 5–9, 1990, Los Angeles, CA, USA (half day).

Reliable Distributed Software. *COMPCON Spring Conference*, February 28–March 3, 1989, San Francisco, CA, USA (full day; with A. Elmagarmid).

Reliable Distributed Systems. *7th International Symposium on Reliable Distributed Systems*, October 10–12, 1988, Columbus, OH, USA (full day; with A. Elmagarmid).

Fault-Tolerant Distributed Software. *COMPCON Spring Conference*, March 1–4, 1988, San Francisco, CA, USA (full day; with A. Elmagarmid).

Distributed Database Operating Systems. *4th International Conference on Data Engineering*, February 1–5, 1988, Los Angeles, CA, USA (half-day).

◇ **Short Courses:**

Foundations of Big Data Systems. Peking University, Beijing, China, 9–14 July 2018 (24 hours).

Components of Modern Database Systems. VLDB Summer School, Tsinghua University, Beijing, China, 27–28 July 2015 (1.5 days, 9 hours).

Distributed Data and Object Management. Institute for Computer Research, University of Waterloo, Waterloo, Canada, 24 – 25 June 1999 (2 days, 12 hours).

Distributed Data and Object Management. University of Udine, Udine, Italy, 27–30 April 1998 (12 hours).

Principles of Distributed Databases. Technical University of Darmstadt, Darmstadt, Germany, 13–24 April 1998 (9 hours).

Special Issues in Advanced Data Management. University of Jyväskylä, Jyväskylä, Finland, 6–9 April 1998 (16 hours).

Distributed Object Management and Interoperability. Summer course at Ecole d.te CEA-EDF-INRIA, Chateau du Breau-sans-Nappe, France, 8–12 July 1996.

Distributed Data Management–Unsolved Problems and New Issues. Bull Worldwide Information Systems, Inc., March 29 – 31, 1993, Phoenix, Arizona.

Distributed Data Management–Unsolved Problems and New Issues. Bull Worldwide Information Systems, Inc., February 7, 1992, Phoenix, Arizona.

Distributed Data Management–Unsolved Problems and New Issues. Short course at Middle East Technical University, July 31, 1991, Ankara, Turkey (half-day).

Data Modeling. Seminar for the Alberta Cancer Board, September 11–13, 1989, Edmonton, Canada.

Advanced Course on Distributed Computing. Summer course at Instituto Tecnológico y de Estudios Superiores, Monterrey, Mexico, June 2–20, 1986.

◇ **Seminars for the Government of Alberta:**

Designed and presented eleven training courses for the Government of Alberta on the following topics: Local Area Network Concepts, Logical Data Modeling for DP Personnel, Micro-Mainframe Connectivity, and Distributed Data Processing.

◇ **UNIDO Seminars:**

Designed and conducted ten seminars under Special Service Agreement with UNIDO (United Nations Industrial Development Organization) on the following topics: Database Management Systems, Engineering Database Organization, Project Planning and Control Techniques, and Use of Computers in Production.



◇ **Keynotes and Distinguished Lectures:**

*A Systematic View of Data Science*, Distinguished Seminar at Istanbul Technical University Artificial Intelligence and Data Science Applied Research Center, 11 June 2021. (Remotely delivered)

*A Systematic View of Data Science*, Distinguished Seminar at Polytechnic University of Hong Kong Research Centre on Data Science and AI, 11 June 2021. (Remotely delivered)

*Streaming Graph Processing & Analytics*, 14th ACM International Conference on Distributed and Event-based Systems, Montreal, Canada, 13-15 July 2020. (Remotely delivered)

*Graph Processing: A Panoramic View and Some open Problems*, 45th International Conference on Very Large Data Bases, Los Angeles, USA, 26-30 August 2019.

*An Introduction to Graph Analytics Platforms*, VLDB 2018 Workshop on Advances in Mining Large-Scale Time-Dependent Graphs, Rio de Janeiro, Brazil, 31 August 2018.

*Web Data Management in RDF Age*, IEEE International Conference on Big Data and Smart Computing (BigComp), Shanghai, China, 15-18 January 2018.

*Web Data Management in RDF Age*, IEEE International Conference on Distributed Computing Systems (ICDCS), Atlanta, USA, 5-8 June 2017.

*Web Data Management in RDF Age*, 20th International Database Engineering & Applications Symposium, Ottawa, Canada, 11-13 July 2016.

*Web Data Management in RDF Age*, University of Alberta, Department of Computer Science, 16 September 2015.

*Web Data Management in RDF Age*, 1st International Forum on Big Search, Malbourne, Australia, 31 May 2015.

*Personal Reflections on Academic Research and Publishing*, PhD Symposium, 40th Int. Conf. on Very Large Data Bases, Hangzhou, China, 1 September 2014.

*gStore: A Graph-based SPARQL Query Engine*, Korea Advanced Institute of Science and Technology, Department of Computer Science 30 September 2013.

*Reflections on Academic Research and Publishing*, ACM SIGMOD/PODS PhD Symposium, New York, 23 June 2013.

*RDF Data Management*, University of Pennsylvania, Department of Computer Science, 3 December 2012.

*Internet Scale Data Distribution: Some Research Problems*, University at Buffalo, The State University of New York, Department of Computer Science and Engineering, 28 April 2011.

*Internet Scale Data Distribution: Some Research Problems*, William Mong Distinguished Lecture, University of Hong Kong, Hong Kong, 13 December 2010.

*Distributed XML Processing*, Seventh International XML Database Symposium (XSym 2010), Singapore, 17 September 2010.

*Distributed XML Processing*, APWeb/WAIM 2009–The Joint International Conferences on Asia-Pacific Web Conference (APWeb) and Web-Age Information Management (WAIM), Suzhou, China, 2-4 April 2009.

*Internet-Scale Data Distribution: Some Research Problems*, 12th East-European Conference on Advances in Databases and Information Systems (ADBIS), Pori, Finland, 5-9 September 2008.

*Internet-Scale Data Distribution: Some Research Problems*, IEEE International Conference on Distributed Computing Systems (ICDCS), Toronto, Canada, 25-29 June 2007.

*Achievements and Remaining Challenges in Multimedia Data Modeling*, 2nd IEEE International Workshop on Multimedia Databases and Data Management, Istanbul, Turkey, 15 April 2007.

*Internet-Scale Data Distribution: Some Research Problems*, 7th International Conference on Web Information Systems Engineering (WISE), Wuhan, China, 23-26 October 2006.

*Query Processing and Optimization in Native XML Databases*, Fourth International XML Database Symposium (XSym 2006), Seoul, Korea, 10-11 September 2006.

*Sliding Window Query Processing over Data Streams*, ETH Zürich, Department of Computer Science, Switzerland, 29 May 2006.

*Query Processing and Optimization in Native XML Databases*, University of Zürich, Department of Informatics, Switzerland, 20 April 2006.

*Query Processing in Data Stream Systems*, Joint Session of 11th International Workshop on Foundations of Models and Languages for Data and Objects - Query Languages and Query Processing, International Conference on Semantics of Networked World, and 2nd International Workshop on Pervasive Information Management, Munich, Germany, 30 March 2006.

*Achievements and Remaining Challenges in Multimedia Data Modeling*, 12th International Multimedia Modeling Conference, Beijing, China, 3-6 January 2006.

*Similarity-based Search of Time Series and Trajectory Data*, New England Database Society, Boston, USA, 20 May 2005.

*Database Issues in Streaming Data*, Queen's University, Kingston, Canada, 6 May 2004.

*Database Issues in Stream Data Management*, Middle East Technical University, Ankara, Turkey, 19 October 2003.

*Querying Image Databases—DISIMA Approach*, Case Western Reserve University, Cleveland, Ohio, 7 February 2002.

*Distributed Data Management Issues in a Changing Environment*, University of Tokyo; SIGMOD Japan Meeting, Tokyo, Japan, 2 December 2001.

*Distributed Data Management Issues in a Changing Environment*, International Workshop on Foundations of Models for Information Integration (FMII-2001), Viterbo, Italy, 16-18 September 2001.

*Flexible Data Integration on the Internet: Current Trends and Issues*, International Workshop on Information Integration on the Web: Technologies and Applications, Rio de Janeiro, Brazil, 9-11 April 2001.

*Document Management Issues in E-Commerce*, 11th International Workshop on Research Issues on Data Engineering (RIDE 2001), Heidelberg, Germany, 1-2 April 2001.

*Database Support for Document and Multimedia Data*, German Database Conference (BTW), Oldenburg, Germany, 7-9 March 2001.

*Issues in Multimedia Data Management*, International Database Engineering and Applications Symposium (IDEAS), Montreal, Canada, August 2-4, 1999.

*Issues in Multimedia Data Management*, 13e Journées de Bases de Données Avancées (BDA), Grenoble, France, September 9-12, 1997.

◊ **Other Invited Talks (since 2000):**

2021:

- *Streaming Graph Processing at Scale*, Waterloo-Huawei Joint Innovation Lab Annual Workshop, 8 June 2021. (Remotely delivered)

2020:

- *Streaming Graph Processing and Analytics*, Data Science Forum, East China Normal University, 2 December 2020. (Remotely delivered)
- *Graph Processing: A Panoramic View and Some open Problems*, Tsinghua University, 22 October 2020. (Remotely delivered)
- *Graph Processing: A Panoramic View and Some open Problems*, Peking University, 30 June 2020. (Remotely delivered)

- *Streaming Graph Processing & Analytics*, Peking University, 22 July 2020. (Remotely delivered)
- *Graph Processing: A Panoramic View and Some open Problems*, Tsinghua University, 22 October 2020. (Remotely delivered)

2019:

- *Graph Processing: A Panoramic View and Some open Problems*, Dagstuhl Workshop on Big Graph Processing Systems, Dagstuhl, Germany, 2 December 2019.

2018:

- *An Introduction to Graph Analytics Platforms*, Fudan University, School of Computing, Shanghai, China, 15 January 2018.
- *An Introduction to Graph Analytics Platforms*, East China Normal University, School of Data Science and Engineering, Shanghai, China, 18 January 2018.

2017:

- *Approaches to RDF Data Management and SPARQL Query Processing*, Inria & Laboratoire d'Informatique, de Robotique et de Microélectronique de Montpellier, Montpellier, France, 9 March 2017.
- *An Introduction to Graph Analytics Platforms*, 8th IEEE Conference on Big Knowledge, Hefei, China, 9–10 August 2017.
- *Web Data Management in the RDF Age*, Hefei University of Technology, Hefei, China, 11 August 2017.

2016:

- *Graph Analytics Platforms*, Huawei Strategy and Technology Workshop, Shenzhen, China, 18 May 2016.
- *Web Data Management in RDF Age*, North Carolina State University, Department of Computer Science, Raleigh, NC, 15 April 2016.
- *An Introduction to Graph Analytics Platforms*, Invited Talk at Spring School “Models, Systems, and Algorithms for Role-based Business Intelligence Applications”, Dagstuhl, Germany, 7–9 March 2016 (3 hour lecture).

2015:

- *An Overview of Graph Data Management and Analysis*, Croucher Advanced Study Institute: Frontiers in Big Graph Research, Hong Kong, 16–18 December 2015 (3 hour lecture).
- *An Overview of Graph Data Management and Analysis*, Australian Database Conference PhD School, Melbourne, Australia, 4 June 2015 (3 hour lecture).
- *Web Data Management in RDF Age*, University of Queensland, School of Information Technology and Electrical Engineering, Brisbane, Australia, 5 June 2015.

2014:

- *Web Data Management in RDF Age*, Polytechnic University of Hong Kong, 26 November 2014.
- *Web Data Management in RDF Age*, Multimedia Software Engineering Research Centre of City University of Hong Kong, Shenzhen, 26 November 2014.
- *An Experimental Comparison of Pregel-like Graph Processing Systems*, OPODIS Workshop, Paris, France, 30 September 2014.
- *Web Data Management in RDF Age*, Inria Saclay, France, 1 October 2014.
- *Personal Reflections on Academic Research and Publishing*, PhD Workshop, 40th Int. Conf. on Very Large Databases, 1 September 2014.
- *Web Data Management in RDF Age*, Modern Database Systems Summit, Tsinghua University, China, 29–31 August 2014.

- *Web Data Management in RDF Age*, Peking University, Institute of Computer Science & Technology, 29 August 2014.

2013:

- *gStore: A Graph-based SPARQL Query Engine*, SAP Labs Korea, 2 October 2013.
- *gStore: A Graph-based SPARQL Query Engine*, Seoul National University, 1 October 2013.
- *gStore: A Graph-based SPARQL Query Engine*, University of Tokyo, 12 March 2013.

2012:

- *RDF Data Management*, University of Manitoba, Department of Computer Science, 29 June 2012.
- *RDF Data Management*, University of Zürich, Department of Computer Science, 1 March 2012.
- *RDF Data Management*, Università degli Studi dell'Insubria, 8 February 2012.
- *RDF Data Management*, Politecnico di Milano, Department of Computer Science, 7 February 2012.
- *Internet-Scale Data Distribution: Some Research Problems*, University of Basel, Department of Mathematics and Computer Science, 19 January 2012.
- *RDF Data Management*, Technische Universität München, Fakultät für Informatik, 11 January 2012.
- *RDF Data Management*, Ludwig-Maximilians-Universität München, Institut für Informatik, 10 January 2012.

2011:

- *Some Results in Graph Data Management*, Humboldt University, Department of Computer Science, 12 December 2011.
- *Some Results in Graph Data Management*, Technical University of Dresden, Department of Computer Science, 8 December 2011.
- *Some Results in Graph Data Management*, EPFL, Faculty of Computer Science, 18 November 2011.
- *Some Results in Graph Data Management*, ETH Zürich, Department of Computer Science, Switzerland, 31 October 2011.

2010:

- *Distributed XML Processing*, Hong Kong University of Science and Technology, Hong Kong, 15 December 2010.
- *Distributed XML Processing*, Nanyang Technological University, Singapore, 10 December 2010.
- *Internet-Scale Data Distribution: Some Research Problems* Maltepe University, 28 May 2010, Istanbul, Turkey.

2006:

- *Sliding Window Query Processing over Data Streams*, Hong Kong University of Science and Technology, Department of Computer Science, China, 26 October 2006.
- *Sliding Window Query Processing over Data Streams*, National University of Singapore, School of Computing, Singapore, 20 October 2006.
- *Query Processing and Optimization in Native XML Databases*, National University of Singapore, School of Computing, Singapore, 6 October 2006.
- *Sliding Window Query Processing over Data Streams*, Université Paris Dauphine, Laboratoire d'Analyse et Modélisation de Systèmes pour l'Aide à la décision, 5 June 2006.

- *Sliding Window Query Processing over Data Streams*, Université de Nantes, Laboratoire d'Informatique de Nantes Atlantique, 1 June 2006.
- *Query Processing and Optimization in Native XML Databases*, Tsinghua University, Department of Computer Science, 10 January 2006.
- *Query Processing and Optimization in Native XML Databases*, Microsoft Research Asia, Beijing, China, 9 January 2006.

2005:

- *Update-Pattern-Aware Modeling and Processing of Continuous Queries*, National University of Singapore, School of Computing, 26 April 2005.
- *Similarity-based Search of Time Series and Trajectory Data*, University of Uppsala, Uppsala, Sweden, 2 February 2005.

2004:

- *Windowed Join Processing over Data Streams*, University of Vienna, Vienna, Austria, 23 April 2004.
- *A Succinct Physical Storage Scheme for Efficient Evaluation of XPath Queries in XML*, Arizona State University, Tempe, AZ, USA, 20 February 2004.

2003:

- *Database Issues in Stream Data Management*, University of Uppsala, Uppsala, Sweden, 11 October 2003.
- *Database Issues in Stream Data Management*, University of British Columbia, Vancouver, Canada, 24 July 2003.

2002:

- *XBench: A Family of XML Benchmarks*, CASCON Conference Workshop on XML Data Management, Toronto, Canada, 1 October 2002.
- *XBench: A Family of XML Benchmarks*, Workshop on Efficiency and Effectiveness of XML Tools and Techniques, Hong Kong, 19 August 2002.
- *Querying Image Databases—DISIMA Approach*, Ohio State University, Columbus, OH, USA, 22 April 2002.
- *Querying the Web—Question Answer Approach*, University of Maryland Baltimore County, Baltimore, MD, USA, 15 March 2002.
- *Querying the Web—Question Answer Approach*, Northwestern University, Evanston, IL, USA, 5 March 2002.
- *Querying the Web—Question Answer Approach*, Georgia Institute of Technology, Atlanta, GA, USA, 22 February 2002.
- *DISIMA Distributed Image Database System—Experiences and Reflections*, Technical University of Dresden, Dresden, Germany, 24 January 2002.

2000:

- *Evaluation of Client-Server Object DBMSs*, IBM CASCON Conference, Toronto, Canada, November 15, 2000.
- *Adaptive Distributed DBMS Architectures*, GMD-IPSI, Darmstadt, Germany, September 15, 2000.
- *An Interoperable Multimedia Catalog System for Electronic Commerce*, Third International Workshop on Technological Challenges of Electronic Commerce, Waterloo, Canada, 28-29 June 2000.

- A1. M. Tamer Özsu and Patrick Valduriez. *Principles of Distributed Database Systems*. Springer, 4th edition, 2020.

The book has been translated into:

- Portugese (second edition)
- Chinese (third edition), Tsinghua University Press, 2014.

- A2. Lukasz Golab and M. Tamer Özsu. *Data Stream Systems*. Synthesis Lectures on Data Management. Morgan & Claypool, 2010.

- A3. M. Tamer Özsu. *Project Planning and Control Techniques*. Turkish Information Processing Society Press, 1986. (in Turkish).

◊ **Edited Books/Proceedings:**

- B1. Ling Liu and M. Tamer Özsu, editors. *Encyclopedia of Database Systems*. Springer, 2nd edition, 2019.

- B2. Mario A. Nascimento, M. Tamer Özsu, Donald Kossmann, Renee J. Miller, Jose A. Blakeley, and K. Berni Schiefer, editors. *Proc. Thirtieth International Conference on Very Large Data Bases*. VLDB Endowment, 2004.

- B3. Anne B. Pidduck, John Mylopoulos, Carson C. Woo, and M. Tamer Özsu, editors. *Advanced Information Systems Engineering – Proc. 14th International Conference (CAiSE 2002)*, Lecture Notes in Computer Science 2348. Springer, 2002.

- B4. Mario Nascimento, M. Tamer Özsu, and Osmar Zaiane, editors. *Proc. International Database Engineering & Applications Symposium*. IEEE Computer Society, 2002.

- B5. M. Tamer Özsu, Hans-Jörg Schek, Katsumi Tanaka, Yanchun Zhang, and Yahiko Kambayashi, editors. *Proc. 2nd International Conference on Web Information Systems Engineering*. IEEE Computer Society, 2001.

- B6. Asuman Dogac, M. Tamer Özsu, and Ozgur Ulusoy, editors. *Current Trends in Data Management Technology*. Idea Group Publishers, 1999.

- B7. Sushil Jajodia, M. Tamer Özsu, and Asuman Dogac, editors. *Advances in Multimedia Information Systems - Proceedings of the 4th International Workshop on Multimedia Information Systems*, Lecture Notes in Computer Science 1508. Springer, 1998.

- B8. Asuman Dogac, L. Kalinichenko, M. Tamer Özsu, and Amit P. Sheth, editors. *Advances in Workflow Systems and Interoperability*. Springer, 1998.

- B9. A. Dogac, M.T. Özsu, A. Biliris, and T. Sellis, editors. *Advances in Object-Oriented Database Systems*. Springer, 1994.

- B10. M. Tamer Özsu, Umeshwar Dayal, and Patrick Valduriez, editors. *Distributed Object Management*. Morgan Kaufmann, 1994.

- B11. O. Bukhres, M. Tamer Özsu, and M.C. Shan, editors. *Proc. RIDE'95 Workshop on Distributed Object Management*. IEEE Computer Society, 1985.

- B12. M. Tamer Özsu and J. Schaeffer, editors. *Proc. CIPS (Canadian Information Processing Society) Edmonton '86 Conf.*, 1986.

◊ **Chapters in Books:**

- C1. Patrick Valduriez, Ricardo Jimenez-Peris, and M. Tamer Özsu. Distributed database systems: The case for NewSQL. In Abdelkader Hameurlain and A. Min Tjoa, editors, *Transactions on Large-Scale Data- and Knowledge-Centered Systems*, pages 1–15. Springer, Berlin, Heidelberg, 2021.

- C2. M. Tamer Özsu and Patrick Valduriez. Distributed and parallel database systems. In Heikki Topi and Allen B. Tucker, editors, *Computing Handbook*, volume 2: Information Systems and Information Technology of *Computing Handbook Set*, chapter 13. CRC Press, 3rd edition, 2014.

- C3. Ning Zhang and M. Tamer Özsu. XML native storage and query processing. In C. Li and T. W. Ling, editors, *Advanced Applications and Structures in XML Processing: Label Streams, Semantics Utilization and Data Query Technologies*, chapter 1, pages 1–17. IGI Global, 2010.
- C4. M. Tamer Özsu and Patrick Valduriez. Distributed and parallel database systems. In Allen B. Tucker, editor, *Handbook of Computer Science and Engineering*, chapter 58. CRC Press, 2nd edition, 2004.
- C5. M. Tamer Özsu. Distributed database systems. In H. Bigdoli, editor, *Encyclopedia of Information Systems*, pages 673–682. Academic Press, 2002.
- C6. M. Tamer Özsu and Bin Yao. Building component database systems using CORBA. In Klaus Dittrich and Andreas Geppert, editors, *Component Database Systems*, pages 207–236. Morgan Kaufmann, 2001.
- C7. Iqbal Goralwalla, M. Tamer Özsu, and Duane Szafron. An object-oriented framework for temporal data models. In Opher Etzion, Sushil Jajodia, and S. Sripada, editors, *Temporal Databases: Research and Practice*, pages 1–35. Morgan Kaufmann, 1998.
- C8. Ling Liu, Lingling Yan, and M. Tamer Özsu. Interoperability in large-scale distributed information delivery systems. In Asuman Dogac, Leonid Kalinichenko, M. Tamer Özsu, and Amit P. Sheth, editors, *Advances in Workflow Systems and Interoperability*, pages 246–280. Springer, 1998.
- C9. M. Tamer Özsu and Patrick Valduriez. Distributed and parallel database systems. In Allen B. Tucker, editor, *Handbook of Computer Science and Engineering*, pages 1093–1111. CRC Press, 1997.
- C10. M. Tamer Özsu. Transaction models and transaction management in object-oriented database management systems. In A. Doğaç, M.T. Özsu, A. Biliris, and T. Sellis, editors, *Advances in Object-Oriented Database Systems*, pages 147–184. Springer, 1994.
- C11. M. Tamer Özsu, Umeshwar Dayal, and Patrick Valduriez. An introduction to distributed object management. In M. Tamer Özsu, Umeshwar Dayal, and Patrick Valduriez, editors, *Distributed Object Management*, pages 1–24. Morgan Kaufmann, 1994.
- C12. M. T. Özsu and J. Blakeley. Query processing in object-oriented database systems. In W. Kim, editor, *Modern Database Management – Object-Oriented and Multidatabase Technologies*, pages 146–174. Addison-Wesley/ACM Press, 1994.
- C13. M. Tamer Özsu, Dave D. Straube, and R. Peters. Query processing issues in object-oriented knowledge base systems. In F.E. Petry and L.M. Delcambre, editors, *Intelligent Database Technology: Approaches and Applications*, volume 1, pages 79–144. JAI Press, 1994.
- C14. M. T. Özsu and P. Valduriez. Distributed data management: Unsolved problems and new issues. In T. Casavant and M. Singhal, editors, *Readings in Distributed Computing Systems*, pages 512–544. IEEE/CS Press, 1994.
- C15. A. Buchmann, M. Tamer Özsu, M. Hornick, Dimitrios Georgakopoulos, and F.A. Manola. A transaction model for active distributed object systems. In Ahmed K. Elmagarmid, editor, *Transaction Models for Advanced Database Applications*, pages 123–158. Morgan Kaufmann, 1992.
- ◊ **Refereed Journal Papers:**
- D1. Da Yan, Guimu Guo, Jalal Khalil, M. Tamer Özsu, Wei-Shinn Ku, and John C.S. Lui. G-thinker: A general distributed framework for finding qualified subgraphs in a big graph with load balancing. *VLDB J.*, 2021. Accepted for publication.
- D2. Peng Peng, Qi Ge, Lei Zou, M. Tamer Özsu, Zhiwei Xu, and Dongyan Zhao. Optimizing multi-query evaluation in federated RDF systems. *IEEE Trans. Knowl. and Data Eng.*, 33(4):1692–1707, 2021.

- D3. Guimu Guo, Da Yan, M. Tamer Özsu, Zhe Jiang, and Jalal Khalil. Scalable mining of maximal quasi-cliques: An algorithm-system codesign approach. *Proc. VLDB Endowment*, 14(4):573 – 585, 2020.
- D4. Youhuan Li, Lei Zou, M. Tamer Özsu, and Dongyan Zhao. Space-efficient subgraph search over streaming graph with timing order constraint. *IEEE Trans. Knowl. and Data Eng.*, 2021. Accepted for publication (October 2020).
- D5. Y. Chen, G. Xiao, M. T. Özsu, C. Liu, A. Y. Zomaya, and T. Li. aeSpTV: An adaptive and efficient framework for sparse tensor-vector product kernel on a high-performance computing platform. *IEEE Trans. Parall. Dist. Sys.*, 31(10):2329–2345, 2020.
- D6. Xiaofei Zhang and Tamer Özsu. Correlation constraint shortest path over large multi-relation graphs. *Proc. VLDB Endowment*, 12(5):488–501, 2019.
- D7. Günes Aluç, M. Tamer Özsu, and Khuzaima Daudjee. Clustering RDF databases using Tunable-LSH. *VLDB J.*, 28(2):173–195, 2019.
- D8. Semih Salihoglu and M. Tamer Özsu. Response to ‘Scale up or scale out for graph processing?’. *IEEE Internet Comput.*, 22(5):18–24, 2018.
- D9. Khaled Ammar and M. Tamer Özsu. Experimental analysis of distributed graph systems. *Proc. VLDB Endowment*, 11(10):1151–1164, 2018.
- D10. Siddhartha Sahu, Amine Mhedhbi, Semih Salihoglu, Jimmy Lin, and M. Tamer Özsu. The ubiquity of large graphs and surprising challenges of graph processing. *Proc. VLDB Endowment*, 11(4):420–431, 2017. (Best paper of VLDB 2018 Conference.)
- D11. Yuke Yang, Lukasz Golab, and M. Tamer Özsu. ViewDF: Declarative incremental view maintenance for streaming data. *Inf. Syst.*, 71:55–67, 2017.
- D12. Lei Zou and M. Tamer Özsu. Graph-based RDF data management. *Data Science and Engineering*, 2(1):56–70, 12 2017.
- D13. Da Yan, James Cheng, M. Tamer Özsu, Fan Yang, Yi Lu, John C.S. Liu, Qizhen Zhang, and Wilfred Ng. A general-purpose query-centric framework for querying big graphs. *Proc. VLDB Endowment*, 9(7):564 – 575, 2016.
- D14. Peng Peng, Lei Zou, M. Tamer Özsu, Lei Chen, and Dongyan Zhao. Processing SPARQL queries over distributed RDF graphs. *VLDB J.*, 25(2):243–268, 2016.
- D15. Çağrı Balkesen, Jens Teubner, Gustavo Alonso, and M. Tamer Özsu. Main-memory hash joins on modern processor architectures. *IEEE Trans. Knowl. and Data Eng.*, 27(7):1754–1766, 2015.
- D16. Minyang Han, Khuzaima Daudjee, Khaled Ammar, M. Tamer Özsu, Xingfang Wang, and Tianqi Jin. An experimental comparison of Pregel-like graph processing systems. *Proc. VLDB Endowment*, 7(12):1047–1058, 2014.
- D17. Prima Chairunnanda, Khuzaima Daudjee, and M. Tamer Özsu. ConfluxDB: multi-master replication for partitioned snapshot isolation databases. *Proc. VLDB Endowment*, 7(11):947–958, 2014.
- D18. Lei Zou, M. Tamer Özsu, Lei Chen, Xuchuan Shen, Ruizhe Huang, and Dongyan Zhao. gStore: A graph-based SPARQL query engine. *VLDB J.*, 23(4):565–590, 2014.
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- F2. M. Tamer Özsu. A survey of RDF data management systems. *Front. Comput. Sci.*, 10(3):418–432, 2016.
- F3. Şule Gündüz and M. Tamer Özsu. Recommendation models for user accesses to web pages. In *Proc. Joint Int. Conf. on Artificial Neural Networks and Neural Information Processing*, pages 1003–1010, 2003 (Text of invited talk.)
- F4. Benjamin Bin Yao, M. Tamer Özsu, and John Keenleyside. XBench - A family of benchmarks for XML DBMSs. In *Efficiency and Effectiveness of XML Tools and Techniques and Data Integration over the Web — Proc. of VLDB Workshops EEXTT and DiWeb*, Lecture Notes in Computer Science 2590, pages 162–164, 2002.
- F5. M. Tamer Özsu. Database support for document and multimedia databases. In *Proc. Datenbanksysteme in Büro, Technik und Wissenschaft (BTW)*, page 3, 2001 (Abstract of keynote address.)
- F6. M. Tamer Özsu. Document management issues in e-commerce. In *Proc. 11th Int. Workshop on Research Issues on Data Eng.*, 2001 (Abstract of keynote address.)
- F7. M. Tamer Özsu. Flexible data integration on the internet: Current trends and issues. In *Proc. Workshop on Information Integration on the Web*, page 1, 2001 (Abstract of keynote address.)
- F8. M. Tamer Özsu, Hans-Jörg Schek, Katsumi Tanaka, and Yanchun Zhang. Special issue on the 2nd web information systems engineering conference (WISE'01). *World Wide Web J.*, 4(3):147–149, 2001.
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- G2. O. Hartig and M. T. Özsu. Linked data query processing. In *Proc. 30th Int. Conf. on Data Engineering*, pages 1286–1289, 2014.
- G3. Vincent Oria, M. Tamer Özsu, Paul Iglinski, Bing Xu, and L. Irene Cheng. DISIMA: An object-oriented approach to developing an image database system. In *Proc. 16th Int. Conf. on Data Engineering*, pages 672–673, 2000. System demonstration description.
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- ◇ **Unrefereed Publications:**
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- H6. M. Tamer Özsu and Paul Iglinski. An interoperable multimedia catalog system for electronic commerce. *Q. Bull. IEEE TC on Data Eng.*, 23(1):17–22, 2000.
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- H15. M.T. Özsu. Issues in Distributed Database Systems. *Bilisim* (publication of the Information Processing Society of Turkey), No. 19-20, pages 32–38, March-June 1985.
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- ◇ **Blogs/Editorials/Reviews:**
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- J2. M. T. Özsu, Computer science publication culture: where to go from here?, *ACM SIGMOD Blog*, 17 July 2012. Available at <http://wp.sigmod.org/?p=488>.
- J3. M. Tamer Özsu. Editorial. *VLDB J.*, 14(1):1, 2005.
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- J15. M. Tamer Özsu. Chair’s message. *ACM SIGMOD Rec.*, 30(3):4–5, 2001.
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