
CURRICULUM VITAE

Goce Trajcevski	Department of Electrical Engineering and Computer Science, Northwestern University L356 Technological Institute 2145 Sheridan Road Evanston, IL 60208-3118	Phone: (847) 467-3268 Fax: (847) 491-4455 Email: goce@ece.northwestern.edu http://www.ece.northwestern.edu/~goce
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1. EDUCATION:

PhD in Computer Science 1/1995-8/2002 (Thesis defended 2002)	UNIVERSITY OF ILLINOIS AT CHICAGO, Chicago, IL Department of Computer Science Thesis title: Managing Uncertainty in Moving Objects Databases Advisor: <i>Professor Ouri Wolfson</i>
MS in Computer Science 8/1991-12/1994 (Thesis defended 1994)	UNIVERSITY OF ILLINOIS AT CHICAGO, Chicago, IL Department of Electrical Engineering and Computer Science Thesis title: Minimality of View Updates in Deductive Databases Advisor: <i>Professor Jorge Lobo</i>
BS in Informatics and Automatics, 09/1984 – 06/1989	UNIVERSITY of Sts. KIRIL and METODIJ, Skopje, Macedonia College of Engineering, Faculty of Electrical Engineering, Department of Informatics and Automatics Graduated Summa Cum Laude

2. RESEARCH INTERESTS:

<ul style="list-style-type: none"> ● <u>Mobile Computing and Data Management</u> 	<ul style="list-style-type: none"> - <i>Spatio-Temporal Queries</i> - <i>Uncertainty Management (semantics and processing algorithms)</i> - <i>Data Reduction</i> - <i>Context-Aware Reactive Behavior</i>
<ul style="list-style-type: none"> ● <u>Computational Geometry Techniques in Dynamic Environments</u> 	<ul style="list-style-type: none"> - <i>Algorithmic Techniques for Query Processing in Mobile Settings</i> - <i>Location Management and Quality of Service</i> - <i>On-Line Data Reduction</i>
<ul style="list-style-type: none"> ● <u>Context-Aware Data Management and Mobility</u> 	<ul style="list-style-type: none"> - <i>Correlations among Context Dimensions and Event Notification Systems</i> - <i>Management of (consistency of the answers to) Continuous Queries</i> - <i>Reactive Behavior and Events Processing (semantics and detection)</i> - <i>Dynamic Topological Predicates</i>
<ul style="list-style-type: none"> ● <u>Query Processing in Sensor Networks</u> 	<ul style="list-style-type: none"> - <i>Uncertainty and Network Topologies</i> - <i>Adaptable Routing Algorithms</i> - <i>Mobility and Cooperation with Ad-Hoc Networks</i>

3. WORKING EXPERIENCE:

<p>-Assistant Chairman (started 9/2008) -Research Assistant Professor (5/2007 – Current)</p>	<p>Northwestern University, Evanston, IL Department of Electrical Engineering and Computer Science. <u>Courses Lectured (2004-2008):</u> -EECS317 <i>Data Management and Information Processing</i> - 4 times -EECS311 <i>Data Structures and Algorithms</i> - 1 time -EECS510 <i>Information Management in Sensor Networks</i> (co-taught with Peter Scheuermann) 2 times</p>
<p>Visiting Scholar/Research Associate (10/2004 – 4/2007)</p>	<p>Northwestern University, Evanston, IL Department of Electrical and Computer Engineering, Database Systems Laboratory, Director: Prof. Peter Scheuermann.</p>
<p>Consultant (11/2004 – 5/2005)</p>	<p>Project: “Geometric Computing” Department of CIS, Polytechnic University, Brooklyn, NY Project Leader: Prof. Herve Bronnimann</p>
<p>Post-Doctoral Research Fellow (10/2003 – 9/2004)</p>	<p>Northwestern University, Evanston, IL Department of Electrical and Computer Engineering, Database Systems Laboratory, Director: Prof. Peter Scheuermann</p>
<p>Visiting Lecturer (Spring Quarter of 2003)</p>	<p>Northwestern University, Evanston, IL Department of Computer Science, <u>Course Lectured:</u> CS317 <i>Data Management and Information Processing</i></p>
<p>System Administrator (Fall 1999 – Spring 2001)</p>	<p>Database and Information Systems Laboratory, Department of Computer Science, University of Illinois at Chicago Duties included basic administration and networking</p>
<p>Lecturer (6/1997 – 9/2003)</p>	<p>University of Illinois at Chicago, Chicago, IL Department of Computer Science (Dept. of EECS until 2000) <u>Courses Lectured:</u> - CS201 (former EECS260) <i>Foundations of Computer Science</i> - 8 times - CS202 (former EECS360) <i>Data Structures and Algorithms</i> - 1 time - CS301 (former EECS361) <i>Languages and Automata</i> - 1 time - CS340 (former EECS370) <i>Software Design</i> - 1 time - CS385 (former EECS370) <i>Operating Systems Concepts and Design</i> - 2 times - CS474 <i>Object-Oriented Programming Languages and Environments</i> - 10 times graduate course and a technical elective for undergraduate students - CS475 (on-line version of CS474) - 2 times - CS513 (former EECS583) <i>Databases and Logic Programming</i> - 1 time graduate course - CS581 <i>Database Management Systems</i> (co-taught with Ouri Wolfson) - 3 times graduate course Duties: complete management of the courses</p>
<p>Teaching Assistant (8/1995 – 5/1997)</p>	<p>University of Illinois at Chicago, Chicago, IL Department of Electrical Engineering and Computer Science <u>Courses:</u> - EECS260 <i>Foundations of Computer Science</i> - 2 times - EECS360 <i>Data Structures and Algorithms</i> - 1 time - EECS474 <i>Object-Oriented Programming Languages and Environments</i> - 2 times - EECS470 <i>Software Engineering</i> - 1 time</p>

	Duties included preparation and grading of students' programming projects and their homework assignments, as well as in-class quizzes, substituting the instructors for lectures when absent and helping them grade midterms and final examinations.
Research Assistant (2/1992 – 5/1995)	University of Illinois at Chicago, Chicago, IL Department of Electrical Engineering and Computer Science Advisor: Prof. Jorge Lobo Conducted research during my MS (and initial PhD) work, mostly related to logical formalization of semantic issues in Active and Deductive Databases, and Workflow Management Systems.
System Engineer (7/1989 – 8/1991)	OP "Informatika i Elektronika", Bitola, Macedonia Duties included systems and networks installation and maintenance, as well as software packages installation and maintenance. Service often done on-site and I have also held several training courses and seminars for the customers.

4. NOMINATIONS, HONORS and AWARDS:

- Best PhD Thesis Nominee, University of Illinois at Chicago, 2003
 - US Geological Survey Scholar, Fall 2000.
 - Best Paper Award (7th International Conference on Cooperative Information Systems (CoopIS)), September 2000.
 - Best TA Nominee, (Dept. of EECS), University of Illinois at Chicago, 1996.
 - 1st Place in Physics Competition, Annual Meeting of Colleges of Electrical Engineering (Elektriada), 1986.
- Pre-Academic Achievements: Five times 1st Place Winner in the National Math Competitions;
 Ranked 1st in the National University Entrance Exam for Technical Colleges
 (Approx. 3,000 applicants)

5. FUNDING (Grants):

• Senior Collaborator:

Context-Aware Computing With Application to Public Health Care Management
ITR Collaborative Proposal, PI: Isabel Cruz (University of Illinois at Chicago)
National Science Foundation (NSF)
 Awarded – Total Fund: \$2,700,000; - Duration: Sep. 2003 – Aug. 2008.
 Collaborated in organizing the proposal and writing two sections.

• Principal Investigator:

Reactive Behavior and Data Reduction for Sensor Data Management
Northrop Grumman Corporation, co-PI: Peter Scheuermann (Northwestern University)
 Awarded – Total Fund: \$315,000; - Duration: June 2005 – December 2007.
 Organizing and writing the main technical parts of the proposal.

6. IMPLEMENTATIONS AND PROTOTYPES:

• **Meta-Updater:**

Prolog implementation of the research results during my MS Thesis work at UIC, published in [J6]. The implementation interfacing the Meta-Updater with a Tcl/Tk based GUI was published in [C28].

• **DOMINO (Database fOr MovINg Objects):**

Participated in the implementation of the DOMINO system, which had already been underway when I joined the team of Prof. Ouri Wolfson as a PhD student. My tasks were in implementing the algorithms for Spatio-temporal range-queries processing (+ uncertainty) in both ver.1 (Informix) and ver.2. (Oracle 8i). Related publications appeared in [C20,C21].

• **CAT (Correct Answers to Continuous Queries Using Triggers):**

Originally assigned as a semester project for the CS583 at UIC (Spring 2003), the final implementation which uses triggers in Oracle 8i to maintain the correctness of the answers to Spatio-temporal queries for trajectories upon dynamic traffic abnormalities. Presented as a demo-paper at EDBT 2004 [C15]

• **OMCAT (Optimizing the Maintenance of Correct Answers to Continuous Queries Using Triggers):**

Continuing the CAT project [C15] and augmenting it with the ideas in [J4], the OMCAT system utilizes some of the semantic dimensions of the Oracle 10g ORDBMS triggers (e.g., *set vs. tuple*; *before vs. after* execution) and greatly improves the efficiency of the CAT. In addition, algorithmic solutions were added for orchestrating the execution of the triggers based on Z-curve ordering. The demo was presented in SIGMOD 2006 [C8], and the methodologies, that became an MS Thesis work of Hui Ding were published in [J1].

7. RECENT PROFESSIONAL ACTIVITIES:

<u>Associate Editor</u>	ACM DiSC (2003-2005)
<u>Local Organization Chair</u>	ACM SIGMOD, 2006
<u>Technical Program Committee Member:</u>	<ul style="list-style-type: none"> - IEEE-MDM Conference 2009. - ACM-GIS Conference 2008; MobiDE Workshop 2008; AINA 2008; MPDMST 2008. - IEEE-MDM Conference, 2007; CAMS Workshop 2007; ACM-GIS Conference, 2007; PDMST Workshop 2007; SAHNS Workshop 2007; MobiDE Workshop 2007. - ACM-GIS Conference, 2006; EDA-PS Conference 2006; DEBS Workshop, 2006; SSTD Conference 2006. - PDMST Workshop, 2005; OTM Federated Conference (CAMS), 2005.
<u>Journals Reviewer:</u>	ACM Transactions on Computational Logic (2008) ACM Transactions on Information Systems (2008) ACM Transactions on Database Systems (2005/2006 and 2006/2007) IEEE Transactions on Knowledge and Data Engineering (2005/2006 and 2007/2008) WINET Wireless Networks (2005 and 2006) The Computer Journal 2005
<u>External Reviewer for Conferences:</u>	EDBT 2008; MDM 2008; ADBIS 2008; ER 2007; ICDE 2007; ADBIS 2007; SIGMOD 2006; ICDE 2006; CIKM 2006; VLDB 2006; CIKM 2005; VLDB2005; ER 2004; SIGMOD 2004; VLDB 2003; SSTD 2003; MDDS 2003; CIKM 2003.
<u>Invited Talks</u>	<ul style="list-style-type: none"> - Moving Objects Databases and Computational Geometry (Brooklyn Polytechnic Institute, May 2004) - Dynamic Topological Predicates and Reactive Behavior (Purdue University, November 2004) - Context-Aware Management of Reactive Behavior in Dynamic Environments (Northrop-Grumman Research Labs, December 2006)
<u>Memberships</u>	Association for Computing Machinery (ACM) Institute of Electrical and Electronics Engineers (IEEE)

8. PUBLICATIONS LIST:

Book Chapters:

1. G. Trajcevski and P. Scheuermann. *Moving Objects Uncertainty*. Encyclopedia of GIS, Springer-Verlag, p. 740-747, 2008.
2. G. Trajcevski and P. Scheuermann. *Active Database Systems*. Encyclopedia of Computer Science, John Willey, 2008 (to appear).
3. G. Trajcevski, O. Wolfson and P. Scheuermann. *Compression of Mobile Location Data*. Encyclopedia of Database Systems, Springer-Verlag, 2009 (to appear).

Journals:

- J1. H. Ding, G. Trajcevski and P. Scheuermann. Efficient Maintenance of Spatio-Temporal Queries for Trajectories. *GeoInformatica Journal*, 12 (3), September 2008.
- J2. H. Cao, O. Wolfson and G. Trajcevski. Spatio-Temporal Data Reduction with Deterministic Error Bounds. *International Journal on Very Large Databases (VLDBJ)*, 15(3), September 2006.
- J3. G. Trajcevski, O. Wolfson, K. Hinrichs and S. Chamberlain. Managing Uncertainty in Moving Objects Databases. *ACM Transactions on Databases Systems (ACM TODS)*, 29(4), September 2004.
- J4. G. Trajcevski and P. Scheuermann. Reactive Maintenance of Continuous Queries. *ACM SIGMOBILE Mobile Computing and Communication Review*, 8(3), July 2004.
- J5. G. Trajcevski, C. Baral and J. Lobo. Formalizing and Reasoning About the Requirements Specifications in Workflow Management Systems. *International Journal on Cooperative Information Systems (IJCIS)*, 10(2), 2001.
- J6. J. Lobo and G. Trajcevski. Minimal and Consistent Evolution of Knowledge Bases. *Journal of Applied Non-Classical Logic*, 7(1-2), January 1997.

Conferences and Workshops:

- C1. G. Trajcevski, R. Tamassia, H. Ding, P. Scheuermann and I. Cruz. Continuous Probabilistic Nearest-Neighbor Queries for Uncertain Trajectories. *International Conference on Extending Database Technology (EDBT)*, March 2009 (accepted, to appear).
- C2. O. Ghica, G. Trajcevski, P. Scheuermann, Z. Bischof and N. Valtchanov. SIDnet-SWANS: a Simulator and Integrated Development Platform for Sensor Networks Applications, *International Conference on Embedded Networked Sensor Systems (SenSys)*, 2008.
- C3. G. Trajcevski, O. Ghica, P. Scheuermann, R. Tamassia and I. Cruz. Alternating Multiple Tributaries and Deltas, *International Workshop on Data Management in Sensor Networks (DMSN – in conjunction with the VLDB conference)*, August 2008.
- C4. H. Ding, G. Trajcevski, P. Scheuermann, X. Wang and E. Keogh. Querying and Mining of Time Series Data: Experimental Comparison of Representations and Distance Measures. *International Conference on Very Large Databases (VLDB)*, August 2008.
- C5. H. Ding, G. Trajcevski and P. Scheuermann. Efficient Similarity Join of Large Sets of Moving Objects Trajectories. *International Symposium on Temporal Representation and Reasoning (TIME)*, 2008.
- C6. G. Trajcevski, H. Ding, P. Scheuermann, R. Tamassia and D. Vaccaro. Dynamics-Aware Similarity of Moving Objects Trajectories. *ACM International Conference on Geographic Information Systems (ACMGIS)*, 2007.
- C7. G. Trajcevski, H. Ding, P. Scheuermann and I. Cruz. BORA: Routing and Aggregation in Distributed Moving Objects Databases. *International Conference on Mobile Data Management (MDM)*, 2007.
- C8. G. Trajcevski and P. Scheuermann. Adaptive and Context-Aware Reconciliation of Reactive Behavior with Pro-Active Consequences. *Active Conceptual Modeling and Learning (ACM-L)*, October 2006.
- C9. G. Trajcevski, H. Cao, O. Wolfson, P. Scheuermann, D. Vaccaro. On-Line Data Reduction and the Quality of History in Moving Objects Databases. *ACM Workshop on Data Engineering for Mobile and Wireless Access (MobiDE – in conjunction with the ACM SIGMOD conference)*, June 2005

- C10. G. Trajcevski, I. Cruz and P. Scheuermann. Moving Volumes, Sensors and Reactive Behavior. *NCGIS Specialist Meetings, June 2006*.
- C11. H. Ding, G. Trajcevski and P. Scheuermann. **OMCAT: Optimal Maintenance of Continuous Queries' Answers for Trajectories**. *ACM International Conference on Management of Data (SIGMOD), June 2006*
- C12. O. Ghica, G. Trajcevski and P. Scheuermann. Adaptive Multi-Routing and Sensor Networks Lifetime. IPSN-WiP workshop, April 2006.
- C13. G. Trajcevski, O. Ghica and P. Scheuermann. **CAR: Controlled Adjustment of Routes and Sensor Networks Lifetime**. *International Conference on Mobile Data Management (MDM), May 2006*.
- C14. G. Trajcevski, P. Scheuermann, O. Ghica, A. Hinze and A. Voisard. Evolving Triggers for Dynamic Environments, *International Conference on Extending Database Technology (EDBT), March 2006*.
- C15. G. Trajcevski, H. Ding and P. Scheuermann. Context-Aware Optimization of Continuous Range Queries for Trajectories. *ACM Workshop on Data Engineering for Mobile and Wireless Access (MobiDE – in conjunction with the ACM SIGMOD conference), June 2005*.
- C16. G. Trajcevski, P. Scheuermann, H. Bronnimann and A. Voisard. Dynamic Topological Predicates and Notifications in Moving Objects Databases. *International Conference on Mobile Data Management (MDM), May 2005*.
- C17. G. Trajcevski, P. Scheuermann and H. Bronnimann. Mission-Critical Management of Mobile Sensors (or, How to Guide a Flock of Sensors). *International Workshop on Data Management in Sensor Networks (DMSN – in conjunction with the VLDB Conference), August 2004*.
- C18. G. Trajcevski, P. Scheuermann, O. Wolfson and N. Nedungadi, **CAT: Correct Answers of Continuous Queries using Triggers**, *International Conference on Extending Database Technology (EDBT), March 2004*.
- C19. G. Trajcevski. Probabilistic Range Queries in Moving Objects Databases with Uncertainty, *International ACM Workshop on Wireless and Mobile Access (MobiDE - in conjunction with the MobiCom conference), September 2003*.
- C20. H. Cao, O. Wolfson and G. Trajcevski. Spatio-Temporal Data Reduction with Deterministic Error Bounds. *DIALM-POMC Joint Workshop on Foundations of Mobile Computing (in conjunction with the MobiCom conference), September 2003*.
- C21. G. Trajcevski and P. Scheuermann. Triggers and Continuous Queries in Moving Objects Databases. *International Workshop on Mobility in Databases and Distributed Systems (MDDS - in conjunction with the DEXA conference), September 2003*.
- C22. G. Trajcevski, O. Wolfson, B. Xu and P. Nelson. Real-Time Traffic Updates in Moving Objects Databases. *International Workshop on Mobility in Databases and Distributed Systems (MDDS - in conjunction with the DEXA conference), September 2002*.
- C23. G. Trajcevski, O. Wolfson, H. Cao, H. Lin, F. Zhang and N. Rishe. Managing Uncertain Trajectories of Moving Objects with DOMINO. *International Conference on Enterprise Information Systems (ICEIS), April 2002*.
- C24. O. Wolfson, H. Cao, H. Lin, G. Trajcevski, F. Zhang and N. Rishe. Management of Dynamic Location Information in DOMINO. *International Conference on Extending Database Technology (EDBT), March 2002*.
- C25. G. Trajcevski, O. Wolfson, F. Zhang and S. Chamberlain. The Geometry of Uncertainty in Moving Objects Databases *International Conference on Extending Database Technology (EDBT), March 2002*.
- C26. G. Trajcevski, O. Wolfson and B. Xu. Research Directions in Moving Objects Databases. *International Conference on Geographic Information Science (GIScience), November 2000*.
- C27. G. Trajcevski, C. Baral and J. Lobo. Formalizing (and Reasoning About) the Specifications of Workflows. *International Conference on Cooperative Information Systems (CoopIS), September 2000. (NOTE: **Best Paper Award**)*
- C28. G. Trajcevski. Formalizing Workflow Specifications *Multiconference on Systemics, Cybernetics and Informatics (SCI), July 2000*.
- C29. G. Trajcevski, C. Baral and J. Lobo. Formalizing Workflows as Collections of Condition-Action Rules (Poster Paper). *NATO-ASI: Workflow Management and Interoperability, August C1997*
- C30. C. Baral, J. Lobo and G. Trajcevski. Formal Characterization of Active Databases: Part II. *International Conference on Deductive and Object-Oriented Databases (DOOD), December C1997*.
- C31. G. Trajcevski, J. Lobo and N. Grover. Meta Updater: An Interactive Tool for Minimal View Updates in Knowledge Bases. *IEEE International Conference on Tools With Artificial Intelligence (TAI), November C1996*.

Other Technical Reports:

- T1. O., Ghica, G. Trajcevski, P. Scheuermann, Z. Bischof and N. Valtchanov. SIDnet-SWANS: a Simulator and Integrated Development Platform for Sensor Networks Applications. *TR-NWU-EECS-08-0, April 2008.*
- T2. G. Trajcevski, P. Scheuermann and D. Vaccaro. The Quality of Spatio-Temporal Data-Reduction for Discretely Sampled Newtonian Motion (Methodology and Experimental Observations), *Technical Report filed with the Northrop-Grumman Corporation, July 2007.*
- T3. G. Trajcevski, P. Scheuermann and D. Vaccaro. On Data-Reduction Issues in Spatio-Temporal Streams. *Technical Report filed with the Northrop-Grumman Corporation, November 2006.*
- T4. G. Trajcevski, P. Scheuermann, H. Bronnimann and A. Voisard. The Dynamics of Notification Requests in Moving Objects Databases. *Technical Report TR-25-04, Department of ECE, Northwestern University, October 2004.*
- T5. G. Trajcevski. Managing Uncertainty in Moving Objects Databases, *PhD Thesis, Department of CS, University of Illinois at Chicago, August 2002.*
- T6. G. Trajcevski and M. Kondratyev. Dual Representation of Workflows. *Technical Report TR-EECS-1999-9, Department of EECS, University of Illinois at Chicago, August 1999.*
- T7. C. Baral, J. Lobo and G. Trajcevski. Formalizing Workflows as Collections of Condition-Action Rules. *Technical Report TR-EECS-1998-2, Department of EECS, University of Illinois at Chicago, February 1998. (NOTE: a poster with the same title was presented at NATO-ASI: Workflow Management and Interoperability, August 1997.)*
- T8. G. Trajcevski. Minimality of View Updates in Deductive Databases. *MS Thesis, Department of EECS, University of Illinois at Chicago, November 1994.*

9. IMMIGRATION STATUS: Permanent US Resident (A# available upon request)

10. REFERENCES:

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<p>Professor Herve Bronnimann</p> <p>CIS Department Polytechnic University 6 MetroTech Center Brooklyn, NY 11201</p> <p>Phone: (718) 269-3538 hbr@poly.edu</p>	<p>Professor Clement Yu</p> <p>Department of Computer Science University of Illinois at Chicago 851 S. Morgan (M/C 152), room 1120 Chicago, IL 60607-7053</p> <p>Phone: (312) 996-2318 yu@cs.uic.edu</p>	<p>Professor Ouri Wolfson</p> <p>Department of Computer Science University of Illinois at Chicago 851 S. Morgan (M/C 152), room 1120 Chicago, IL 60607-7053</p> <p>Phone: (312) 996-6770 wolfson@cs.uic.edu</p>