



# VLDB2011

37<sup>th</sup> International Conference on Very Large Data Bases, Seattle, WA



# Proceedings of the VLDB Endowment

Volume 4, No. 2 – November 2010

**Proceedings of the 37th International Conference on  
Very Large Data Bases, Seattle, WA**

Editor-in-Chief:  
**H. V. Jagadish**

Guest Editors:

**José Blakeley, Joseph M. Hellerstein, Nick Koudas, Wolfgang Lehner, Sunita Sarawagi, Uwe Röhm**

PVLDB – Proceedings of the VLDB Endowment  
Volume 4, No. 2, November 2010.  
The 37th International Conference on Very Large Data Bases, Seattle, WA.

## **Copyright 2010 VLDB Endowment**

Permission to make digital or hard copies of portions of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyright for components of this work owned by others than VLDB Endowment must be honored. Abstracting with credit is permitted. To copy otherwise, to republish, to post on servers or to redistribute to lists requires prior specific permission and/or a fee. Request permission to republish from PVLDB under email: info@vldb.org.

Volume 4, Number 2: VLDB2011 Research Papers  
Pages ii – vi and 46 – 150  
ISSN 2150-8097, November 2010.

Additional copies only online at: [portal.acm.org](http://portal.acm.org) and [www.vldb.org](http://www.vldb.org)

## TABLE OF CONTENTS

### Front Matter

Copyright Notice .....	ii
Table of Contents .....	iii
PVLDB Review Board .....	iv

### Letters

Letter from the VLDB2011 General PC Co-Chair .....	<i>Joseph M. Hellerstein</i> vi
--	---------------------------------

### Research Papers

Distributed Threshold Querying of General Functions by a Difference of Monotonic Representation .....	<i>Guy Sagy, Daniel Keren, Izchak Sharfman, Assaf Schuster</i> 46
On Triangulation-based Dense Neighborhood Graphs Discovery .....	<i>Nan Wang, Jingbo Zhang, Kian-Lee Tan, Anthony K. H. Tung</i> 58
Graph Indexing of Road Networks for Shortest Path Queries with Label Restrictions .....	<i>Michael Rice, Vassilis J. Tsotras</i> 69
CRIUS: User-Friendly Database Design .....	<i>Li Qian, Kristen LeFevre, H. V. Jagadish</i> 81
Efficient Processing of Top-k Spatial Preference Queries .....	<i>João B. Rocha-Junior, Akrivi Vlachou, Christos Doulkeridis, Kjetil Nørvåg</i> 93
HYRISE – A Main Memory Hybrid Storage Engine .....	<i>Martin Grund, Jens Krüger, Hasso Plattner, Alexander Zeier, P. Cudre-Mauroux, Sam Madden</i> 105
Update Rewriting and Integrity Constraint Maintenance in a Schema Evolution Support System: PRISM++ .....	<i>Carlo A. Curino, Hyun Jin Moon, Alin Deutsch, Carlo Zaniolo</i> 117
SXPath - Extending XPath towards Spatial Querying on Web Documents .....	<i>Ermelinda Oro, Massimo Ruffolo, Steffen Staab</i> 129
Personalized Privacy Protection in Social Networks .....	<i>Mingxuan Yuan, Lei Chen, Philip S. Yu</i> 141

## PVLDB REVIEW BOARD

### VLDB2011 General PC Co-Chairs

José Blakeley, Microsoft

Joseph M. Hellerstein, University of California – Berkeley

### VLDB2011 Research Track Co-Chairs

Nick Koudas, University of Toronto and Sysomos Inc.

Wolfgang Lehner, Dresden University of Technology

Sunita Sarawagi, IIT Bombay

### Reviewer

Ashraf Aboulnaga (University of Waterloo)

Sibel Adali (Rensselaer Polytechnic Institute)

Charu Aggarwal (IBM Watson Research Center)

Divyakant Agrawal (Univ. California, Santa Barbara)

Anastasia Ailamaki (EPFL Lausanne)

Gustavo Alonso (ETH Zurich)

Shivnath Babu (Duke University)

Roberto Bayardo (Google)

Elisa Bertino (Purdue University)

Peter Boncz (CWI, Netherlands)

Angela Bonifati (Icar-CNR)

Christof Bornhoevd (SAP Palo Alto)

Mike Cafarella (University of Washington)

K. Selcuk Candan (Arizona State University)

Malu Castellanos (HP Labs)

Tiziana Catarci (University of Rome)

Chee-Yong Chan (National University of Singapore)

Kevin Chang (University of Illinois, Urbana-Champaign)

Surajit Chaudhuri (Microsoft Research)

Rada Chirkova (North Carolina State University)

Jan Chomicki (University at Buffalo)

Chin-Wan Chung (Korea Advanced Institute of SaT)

Chris Clifton (Purdue University)

Christine Collet (Grenoble Institute of Technology)

Graham Cormode (AT&T Labs)

Gautam Das (University of Texas, Arlington)

Anish Das Sarma (Yahoo! Research)

Amol Deshpande (University of Maryland)

AnHai Doan (University of Wisconsin)

Xin Dong (AT&T Labs)

Alexandre Evfimievski (IBM Research)

Wenfei Fan (University of Edinburgh & Bell Labs)

Johann-Christoph Freytag (Humboldt-Universität Berlin)

Johannes Gehrke (Cornell University)

Rainer Gemulla (IBM Almaden Research Center)

Aristides Gionis (Yahoo! Research)

Goetz Graefe (HP Labs)

Torsten Grust (Universität Tübingen, Germany)

Giovanna Guerrini (University of Genova)

Dimitris Gunopulos (University of Athens, Greece)

Theo Haerder (University of Kaiserslautern)

Alon Halevy (Google)

Vagelis Hristidis (Florida International University)

Meichun Hsu (HP Labs, Palo Alto)

Ihab Ilyas (University of Waterloo)

Zachary Ives (University of Pennsylvania)

Dean Jacobs (SAP)

Christian Jensen (Aalborg University)

Chris Jermaine (University of Florida)

Raghav Kaushik (Microsoft Research)

Bettina Kemme (McGill University)  
Eamonn Keogh (University of California, Riverside)  
Martin Kersten (CWI)  
Christoph Koch (Cornell University)  
Flip Korn (AT&T Labs)  
Donald Kossmann (ETH Zurich)  
Alberto Laender (Federal University of Minas Gerais)  
Dongwon Lee (Penn State University)  
Kristen Lefevre (University of Michigan)  
Chen Li (University of California, Irvine)  
Bin Liu (University of Michigan)  
David Lomet (Microsoft Research)  
Samuel Madden (MIT)  
Nikos Mamoulis (University of Hong Kong)  
Ioana Manolescu (INRIA)  
Claudia Medeiros (University of Campinas)  
Sergey Melnik (Google)  
Marco Mesiti (Università degli Studi di Milano)  
Chaitanya Mishra (Facebook Inc.)  
Felix Naumann (University of Potsdam)  
Raymond Ng (University of British Columbia)  
Christopher Olston (Yahoo! Research)  
Themis Palpanas (University of Trento)  
Dimitris Papadias (Hong Kong University of Science and Technology)  
Stavros Papadopoulos (Chinese University of Hong Kong)  
Stefano Paraboschi (University of Bergamo)  
Jian Pei (Simon Fraser University)  
Rachel Pottinger (University of British Columbia)  
Vijayshankar Raman (IBM Almaden Research Centre)  
Prakash Ramanan (Wichita State University)

Louiza Raschid (University of Maryland)  
Kenneth Ross (Columbia University)  
Elke Rundensteiner (Worcester Polytechnic Institute)  
Yehoshua Sagiv (Hebrew University, Jerusalem)  
Ken Salem (University of Waterloo)  
Kai-Uwe Sattler (Ilmenau University of Technology)  
Bernhard Seeger (University of Marburg)  
Jayavel Shanmugasundaram (Yahoo! Research)  
Kyuseok Shim (Seoul National University)  
Divesh Srivastava (AT&T Labs)  
Dan Suciu (University of Washington)  
S. Sudarshan (IIT Bombay)  
Kian-Lee Tan (National University of Singapore)  
Val Tannen (University of Pennsylvania)  
Jens Teubner (ETH Zurich)  
Martin Theobald (Max-Planck-Institut für Informatik)  
Frank Tompa (University of Waterloo)  
Anthony Tung (National University of Singapore)  
Patrick Valduriez (INRIA)  
Wie Wang (University of North Carolina)  
Gerhard Weikum (Max Planck Institute, Germany)  
Yuqing Wu (Indiana University)  
Fei Xu (Microsoft Search)  
Sihem Yahia (Yahoo! Research)  
Jun Yang (Duke University)  
Cong Yu (Yahoo! Research)  
Jefferey Yu (Chinese University of Hong Kong)  
Ting Yu (North Carolina State University)  
Xiaohui Yu (York University)  
Justin Zobel (University of Melbourne)

#### **PVLDB Information Director**

Gerald Weber (University of Auckland)

#### **Steering Committee**

Serge Abiteboul, Peter Apers, Philip Bernstein, Elisa Bertino, Peter Buneman, Martin Kersten, Z. Meral Ozsoyoglu

#### **VLDB2011 Proceedings Chair**

Uwe Roehm (University of Sydney)

## **LETTER FROM THE GENERAL PC CO-CHAIR**

This is the second issue of PVLDB Journal under the new process instituted by the VLDB Board of Trustees, in which the technical program for the VLDB Conference is made up of the contents of the PVLDB Journal for the corresponding year. This structure offers a quick-turnaround monthly cycle of submission, review and publication of conference-style papers, capped by presentations at the annual conference. The process is supported by an ongoing effort on the part of the VLDB program committee and Co-Chairs, and the PVLDB Proceedings Editor. I would like to once again thank the entire set of volunteers for their hard work.

The volume of papers in this issue represents a significant increase over the first issue, and is indicative of the healthy pipeline of strong work under review for future issues. The selection of papers covers a wide variety of topics and methodologies, from authors and institutions spread across the globe. We hope you find these papers thought-provoking and useful, and consider submitting your own best work to future issues.

---

Joseph M. Hellerstein, University of California - Berkeley  
General PC Co-Chair, VLDB 2011