Alexander Kalinin

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EDUCATION

Ph.D. Candidate, Computer Science
DISSERTATION TOPIC - Enabling Integrated Search and Exploration over Large Multidimensional Data
Brown University, Providence, RI — Current

Master of Science, Computer Science
Brown University, Providence, RI — May 2012
THESIS - Interactive Data Exploration Using Semantic Windows
GPA 4.0/4.0

Bachelor of Science, Computer Science (Mathematician, Systems Programmer)
Lomonosov Moscow State University (MSU), Moscow, Russia — June 2007
Graduated with Honors
THESIS - Research and Development of Transaction Processing Methods Based on Snapshots
GPA 4.97/5.0

PROFESSIONAL EXPERIENCE

Brown University — September 2010 – Current
Research Assistant, Data Management Research Group
- R&D of novel methods in data exploration for large data sets. Combining the search efficiency of Constraint Programming with data management capabilities of modern DBMSs.

HP Labs — June 2015 – August 2015
Research Associate Intern, Analytics Group
- R&D for an internal project involving data management.

Brown University — September 2012 – December 2012
Graduate Teaching Assistant, Database Management Systems Course
- Assisted in consulting students and grading. Created one large homework problem per week under a theme of designing and querying an OLAP database.
- Curated "Database Designer" project involving designing an OLAP database (creating indexes, materialized views, etc.) using MySQL in Amazon EC2.

Institute for System Programming of the Russian Academy of Sciences (ISP RAS) — July 2007 – July 2010
Management of Data and Information Systems (MODIS) Group
- R&D for Sedna project, a native XML DBMS (see the Projects section).

PUBLICATIONS

- A. Kalinin, U. Cetintemel, S. Zdonik " Searchlight: Enabling Integrated Search and Exploration over Large Multidimensional Data", VLDB 2015
- A. Kalinin, U. Cetintemel, S. Zdonik "Interactive Data Exploration Using Semantic Windows", ACM SIGMOD 2014
- U. Cetintemel, M. Cherniack, J. DeBrabant, Y. Diao, K. Dimitriadou, A. Kalinin, O. Papaemmanouil, S. Zdonik, "Query Steering for Interactive Data Exploration", CIDR 2013

- I. Taranov, I. Shcheklein, A. Kalinin, et al., "Sedna: native XML database management system (internals overview)", ACM SIGMOD 2010
- A. Kalinin, "DataGuide-based Distribution for XML Documents", SYRCoDIS 2009
- A. Kalinin, "Optimizing Concurrent Processing of Write-then-Read Transactions", SYRCoDIS 2008

PROJECTS

Searchlight – Illuminating data with the power of Constraint Programming 2013 – Current

- Research project involving application of Constraint Programming (CP) methods inside DBMS engines for efficient exploration of large data sets in the presence of user-defined constraints.
- Integration of a CP solver (OR-Tools) into the query execution engine of an array DBMS (SciDB), implemented in C++. The implementation extensively reuses the existing distributed query execution infrastructure. At the same time it introduces its own layer of search-related capabilities, including dynamic search distribution, resource management and dynamic data distribution.
- Paper published at VLDB 2015 (see Publications).

Semantic Windows – Interactive Data Exploration for Big Data 2012 – 2014

- Research project for searching for interesting user-defined regions in large data sets.
- Implemented in C++ as a standalone client working with PostgreSQL via the standard driver. The client was written from scratch, including caching, network and distribution layers.
- Paper published at ACM SIGMOD 2014 (see Publications).

Sedna – Native XML Database System July 2007 – July 2010
Project URL: http://sedna.org/

- Implemented significant parts of transaction processing, logging and recovery systems, version-based storage engine. XQuery parser in Flex/Bison. Static query optimization, based on query rewriting.
- Fully devised and implemented the hot-backup feature, including full and incremental backups.
- Implemented a system to test recovery, based on controlled and random crashes.

TALKS

- "Searchlight: Enabling Integrated Search and Exploration over Large Multidimensional Data", VLDB 2015
- "Interactive Data Exploration Using Semantic Windows", ACM SIGMOD 2014
- "Interactive Data Exploration Using Constraints", New England Database Summit 2014

SKILLS & EXPERTISE

- Solid knowledge of C++ and Java.
- Solid knowledge of scripting languages: Shell (Bash), Python. Experience in writing complex scripts for running stress tests and experiments in Python, including distributed environment (e.g., Fabric).
- Systems programming in Linux (primarily) and Windows (some experience). Writing systems code for network and disk related tasks.
- Solid knowledge of SQL. Knowledge of database development, design and administration: MySQL, PostgreSQL.
- Hands-on knowledge of traditional DBMS internals: query optimizer, transaction processing, logging, recovery.