

MOHAMED SARWAT

200 SE Union Street, 4-192 EE/CSci Bldg , Minneapolis, MN 55455
+1 (612)-516-7777 • sarwat@cs.umn.edu • <http://www-users.cs.umn.edu/~sarwat>

EDUCATION

- **Ph.D.** Computer Science, University of Minnesota – Twin Cities [Expected: December, 2014]
- **M.S.** Computer Science, University of Minnesota – Twin Cities [Sept, 2009 - Oct, 2011]
- **B.S.** Computer Engineering, Cairo University [Sept, 2002 - May, 2007]

ACADEMIC MOTIVATION

I am fascinated by systems research either to give a leg up for emerging applications (e.g., social networks, recommender systems), or to support new platforms and hardware paradigms (e.g., cloud computing, flash memory storage). Building highly effective, efficient and scalable data management systems, as well as establishing the theoretical foundation behind these systems, are my primary academic and research endeavors.

RESEARCH INTEREST

Generally, my research interests touch on various aspects of database systems. More specifically, some of my interests include query processing and optimization, database indexing, spatio-temporal databases, social networking systems and analysis, recommender systems, distributed graph databases, and large scale data management.

EMPLOYMENT HISTORY

- **University of Minnesota Twin Cities**, MN, USA [Sept, 2009 - Present]
Graduate Research Assistant
A member of the Data Management Lab (DMLab) working on research in the broad area of data management systems, recommender systems, social networking, and spatio-temporal databases.
- **NEC Laboratories America**, Cupertino, CA, USA [May, 2011 - Aug, 2011]
Research Intern
A member of the data management group led by Hakan Hacigümüs. While being there, I co-designed and implemented *SMILE*, which is a data sharing middleware useful for seamless mobile computing services in the cloud.
- **Microsoft Research**, Redmond, WA, USA [May, 2010 - Aug, 2010]
Research Intern
A member of the Cloud Computing Research Group (CCRG), part of eXtreme Computing Group (XCG) led by Surajit Chaudhuri. I co-designed and implemented *Horton*; a distributed platform for storing, processing, and querying large distributed graphs.
- **Mentor Graphics**, OR, USA [May, 2008 - Aug, 2009]
Software Development Engineer
A member of Litho-Friendly Design (LFD) team, a part of Calibre software product that performs physical verification on electronic chip design (in the electronic design automation industry).
- **Citex Software**, Cairo, Egypt [Aug, 2007 - May, 2008]
Software Development Engineer
Built a system that handles a stream of mobile short and multimedia messages, processes these messages, and adds e-advertisement to them based on the user profile, user preferences, user behavior, and context.

RESEARCH EXPERIENCE

- **Database support for Online Recommender Systems** [Sept, 2009 - Present]
Worked on *RecStore*; a DBMS storage engine module capable of efficient online recommendation model maintenance. Externally, models managed by *RecStore* behave as relational tables, thus existing SQL-based recommender queries remain unchanged while gaining online model support.
- **Location-Aware Social Networking Systems** [Sept, 2010 - Present]
Worked on *Sindbad*; a location-aware social networking system. Sindbad supports three new services beyond traditional social networking services, namely, *location-aware news feed*, and *location-aware recommender*. These new services not only consider social relevance for its users, but they also consider spatial relevance. Sindbad is designed to deal with large number of users, large number of messages, and user mobility, to achieve higher system efficiency and scalability.

- **Data Management on Flash Memory Devices** [Sept, 2009 - Sept, 2010]
Worked on *FAST*; which is a generic framework for flash-aware data-partitioning tree index structures. *FAST* optimizes existing DBMS tree index structures for the distinguishing properties of the flash memory storage systems. *FAST* is a generic framework that can be applied to a wide class of data partitioning tree structures. It achieves both efficiency and durability of read and write flash operations.
- **Query Execution over Large Distributed Graphs** [May, 2010 - Aug, 2010]
Worked on *Horton*; a library for processing large and distributed graphs (billions of nodes and edges). The library provides a querying interface, query execution engine, and query optimizer to search the graph for matching paths. *Horton* is built on top of Orleans (research project at Microsoft Research), which is a software framework for building client + cloud applications.
- **Multi-Tenants Data Sharing in the Cloud** [May, 2011 - Aug, 2011]
Designed and implemented a system for data sharing in the cloud. The system decides how the data should be shared among different tenants (i.e., applications) residing on different machines (i.e., in the cloud) so that all tenants requirements/constraints are satisfied and the total system profit is maximized.

PUBLICATIONS

Refereed Journal Articles

- [1] Mohamed Sarwat, Justin J. Levandoski, Ahmed S. Eldawy, Mohamed F. Mokbel. "**MARS: on incorporating Mobility Awareness into Recommender Systems**" *Under Preparation*
- [2] Mohamed Sarwat, Mohamed F. Mokbel, Xun Zhou, Suman Nath. "**Generic and Efficient Framework for Search Tree Index Structures on Flash Memory Storage Systems**" *Under Review at the International Journal on Advances of Computer Science for Geographic Information Systems, GeoInformatica 2012*

Refereed Conference/Workshop Papers

- [1] Mohamed Sarwat, Ahmed S. Eldawy, Mohamed F. Mokbel, John Riedl. "**Plutus: A Viral Marketing Framework for Recommending Customers to Venues in Location-Based Social Networks**" *Under Preparation*
- [2] Mohamed Sarwat. "**RecDB: Towards DBMS Support for Online Recommender Systems**" *In Proceedings of SIGMOD/PODS Ph.D. Symposium 2012, SIGMOD 2012, Scottsdale, AZ, May 2012*
- [3] Justin Levandoski, Mohamed Sarwat, Ahmed S. Eldawy, Mohamed F. Mokbel. "**LARS: A Location-Aware Recommender System**" *To appear in Proceedings of the 28th IEEE International Conference on Data Engineering, ICDE 2012, Washington D.C., April 2012 (Acceptance Rate: 17.7 %) (Best Research Paper Nominee)*
- [4] Justin J. Levandoski, Mohamed Sarwat, Mohamed F. Mokbel, Michael D. Ekstrand. "**RecStore: An Extensible and Adaptive Framework for Online Recommender Queries inside the Database Engine**" *To appear in Proceedings of the 15th International Conference on Extending Database Technology, EDBT 2012, Berlin, Germany, March 2012 (Acceptance Rate: 22.5 %)*
- [5] Mohamed Sarwat, Mohamed F. Mokbel, Xun Zhou, Suman Nath. "**FAST: A Generic Framework for Flash-Aware Spatial Trees**" *In proceedings of the 12th International Symposium on Spatial and Temporal Databases, SSTD 2011, Minneapolis, MN, August 2011 (Acceptance Rate: 32 %) (Best Research Paper Award)*
- [6] Mohamed F. Mokbel, Jie Bao, Ahmed S. Eldawy, Justin Levandoski, Mohamed Sarwat. "**Personalization, Socialization, and Recommendations in Location-based Services 2.0**" *In Proceedings of the 5th International Workshop on Personalized Access, Profile Management, and Context Awareness in Databases, PersDB 2011 in Conjunction with VLDB 2011, Seattle, WA, September 2011*

Refereed System Demonstrations

- [1] Mohamed Sarwat, Jie Bao, Ahmed S. Eldawy, Justin J. Levandoski, Mohamed F. Mokbel. "**Sindbad: A Location-Aware Social Networking System**" *To appear in Proceedings of ACM International Conference on Management of Data, SIGMOD 2012, Scottsdale, AZ, May 2012 (Demo Paper) (Acceptance Rate: 42 %)*
- [2] Mohamed Sarwat, Sameh Elnikety, Yuxiong He, Gabriel Kliot. "**Horton: Online Query Execution Engine For Large Distributed Graphs**" *To appear in Proceedings of the 28th IEEE International Conference on Data Engineering, ICDE 2012, Washington D.C., April 2012 (Demo Paper) (Acceptance Rate: 41 %)*

TECHNICAL TALKS

- "LARS: A Location-Aware Recommender System." – ICDE 2012, Washington DC, April 2012
- "RecStore: An Extensible and Adaptive Framework for Online Recommender Queries inside the Database Engine." – EDBT 2012, Berlin Germany, March 2012
- "Data Sharing Support in Cloud Databases." – NEC laboratories America, Cupertino CA, August 2011
- "FAST: A Framework for Flash-Aware Spatial Trees." – SSTD, Minneapolis MN, August 2011
- "Online Query Execution on Large-Scale Graphs." – Microsoft Research, Redmond WA, August 2010

HONORS AND AWARDS

- **Best Research Paper Award** in 12th International Symposium on Spatial and Temporal Databases SSTD 2011.
- **Best Research Paper Nominee** in 28th IEEE International Conference on Data Engineering ICDE 2012.
- **Doctoral Dissertation Fellowship Nominee**, University of Minnesota 2012.
- **NSF ICDE 2012 Scholarship** to attend the 28th International Conference on Data Engineering ICDE 2012.
- **NSF Travel Fellowship** to attend the 15th International Conference on Extending Database Technology EDBT 2012.
- **Google Travel Fellowship**, to attend PersDB 2011 co-located with VLDB 2011.
- **Graduate Research Assistantship**, University of Minnesota.
- **National Scholarship for Academic Excellence**, Cairo University.

SERVICE AND ACTIVITIES

- Webmaster/Organizer for NSF Workshop on Social Networks and Mobility in the Cloud, 2012
- **External Reviewer/Reviewer:**
 - ACM International Conference on Management of Data *SIGMOD 2010,2012*.
 - International Conference on Very Large Databases *VLDB 2010,2012*.
 - IEEE International Conference on Data Engineering *ICDE 2011, 2012*.
 - IEEE International Conference on Distributed Computing Systems *ICDCS 2011,2012*.
 - 24th International Conference on Scientific and Statistical Database Management *SSDBM 2012*
 - IEEE International Conference on Mobile Data Management *MDM 2012*
 - ACM International Conference on Information and Knowledge Management *CIKM 2010*.
 - IEEE Transactions on Knowledge and Data Engineering *TKDE*.
 - ACM Transactions on Database Systems *TODS*.
- Member of University of Minnesota *Digital Technology Center (DTC)*.
- Student Member of ACM and IEEE.

COMPUTER SKILLS

- Software development in C, C++, C#, Java, Python, TCL/TK.
- Familiarity with Regular Expressions, Threads, Sockets, Database Design, SQL, L^AT_EX
- Familiarity with UNIX, GNU/Linux, Win32.

REFERENCES

Available Upon Request