

Mohamed Aly

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Education

Ph.D. in Computer Science, University of Pittsburgh
GPA: 3.813/4.0, Graduation Date: December 2008
Thesis Title: "Load-Balancing Hotspots In Sensor Storage Systems"

Master of Computer Science, University of Pittsburgh
GPA: 3.813/4.0, Graduation Date: December 2007

Master of Computer Science (all but thesis), Alexandria University, Egypt (September 2002 - June 2004),
Grade: Distinction.

Bachelor of Computer Science and Engineering, Alexandria University, Egypt (September 1997 - June 2002),
Grade: Distinction with degree of honor.

Research Interests

My main research interests lie in applied algorithms and large-scale data management. I am interested in solving theoretical and applied algorithmic data management problems arising in general computer systems, sensor and wireless networks, communication networks, storage systems, and web 2.0 applications and social networks. In general, my research style is to try to formalize optimization problems capturing the essence of real-world problems, find policies that are optimal for these problems, and finally use experimentation to validate the performance of the discovered policy in as real of a setting as possible. My theoretical research interests lie in approximation and online algorithms, randomized algorithms, combinatorial optimization, and distributed algorithms. My PhD research was mainly focusing on designing efficient and scalable distributed load-balanced indexing algorithms for data storage in for large-scale sensor networks.

Work Experience

Yahoo Inc.

February 2008 to present

Working as a back-end software/research engineer in the Yahoo! Open Strategy (Y!OS) platform, a new platform that is intended to rewire all the Yahoo! products to be more open and social. Within Y!OS, I am part of the team working on building the social platform intended to add the new social dimension across all Yahoo! products. My assignment involves designing and implementing new functionalities in the platform, researching and early solving newly arising problems, and evaluating new ideas for our new platform.

University of Pittsburgh

September 2007 to January 2008

Andrew-Mellon fellow at the Department of Computer Science.

Google Research Labs

February 2007 to July 2007

Worked on the content-ads targeting system, Google Adsense, to enhance performance on social networks sites, e.g. myspace. Analysed the content of the social network sites and applied techniques such as clustering, classification, and collaborative filtering. Developed novel collaborative filtering algorithms for large social networking graphs, with some existing publications and pending patents.

University of Pittsburgh

August 2004 to January 2007

Graduate Student Researcher and Teaching Assistant

Advisors: Prof. Kirk Pruhs and Prof. Panos K. Chrysanthis

Teaching experience:

- CS 1501: Algorithms Implementation Spring 2006, Fall 2006.
- CS 1510: Algorithm Analysis and Design Fall 2005.

Bibliotheca Alexandrina, Alexandria, Egypt

August 2002 to July 2004

[February, 2003 – July, 2004] Network and Systems Administrator.

- Administrating more than 40 computer servers and 900 PCs with different computing environments, e.g. Unix, Windows, and Solaris.
- Implemented and operated a complete computerized gate security system for the library serving employees, members, and visitors. Took care of all the integration tasks with the library HR system, financial system, and book system.

[August, 2002 – January, 2003] Software Engineer.

- Built a complete payroll web application with its backend integrated with the Oracle Applications ERP system.
- Performed a full migration of the complete Oracle Applications production system of the library from a Windows environment to a Sun Solaris environment.

Publications

Conferences

1. M. Aly, A. Gopalan, A. Youssef, and J. Zhao. "STDCS: Spatio-Temporal Data-Centric Storage for Real-Time Sensor Applications". In Proc. of the 5th IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON08), 2008
2. S. Baluja, R. Seth, D. Sivakumar, Y. Jing, J. Yagnik, S. Kumar and D. Ravichandran, and M. Aly. "Video Suggestion and Discovery for Youtube: Taking Random Walks through the View Graph". In Proc. of the 17th International World Wide Web Conference (WWW08), 2008.
3. M. Aly, A. Gopalan, and A. Youssef. "Load-Balancing Query Hotspots for Next-Generation Sensor-nets". In Proc. of the 50th IEEE Global Telecommunications Conference (GLOBECOM07), 2007.
4. M. Aly and A. Gopalan. "TOLB: A Traffic-Oblivious Load-Balancing Protocol for Next-Generation Sensornets". In Proc. of the 6th International Conference on AD-HOC Networks & Wireless (AdHoc-Now07), 2007.
5. M. Aly and J. Augustine. "Online Packet Admission and Oblivious Routing in Sensor Network". In Proc. of the 17th International Symposium on Algorithms and Computation (ISAAC06), 2006.
6. M. Aly, K. Pruhs, and P. K. Chrysanthis,. "KDDCS: A Load-Balanced In-Network Data-Centric Storage Scheme in Sensor Networks". In Proc. of the 15th ACM Conference on Information and Knowledge Management (CIKM06), 2006.
7. M. Aly, P. K. Chrysanthis, and K. Pruhs. "Decomposing Data-Centric Storage Query Hot-Spots in Sensor Networks". In Proc. of the 3rd International Conference on Mobile and Ubiquitous Systems, Networks, and Services (MOBIQUITOUS06), 2006.
8. M. Aly, K. Pruhs, T. Znati and B. Hunsaker. "On the Coverage Problem for Myopic Sensors". In Proc. of the IEEE International Conference on Wireless Networks, Communications, and Mobile Computing (WirelessCom05), 2005.

Workshops

1. M. Aly, N. Morsillo, P. K. Chrysanthis, and K. Pruhs. "Zone Sharing: A Hot-Spots Decomposition Scheme for Data-Centric Storage Sensor Networks". Proc. of the 2nd Int. VLDB Workshop on Data Management for Sensor Networks (DMSN05), 2005.

Papers Submitted or In-Preparation:

1. "Local Detection and Decomposition of Concurrent Storage and Query Hotspots in Data-Centric Storage Sensor Networks". Submitted.
2. "Extending KDDCS to Avoid Query and Mixed Hotspots in Data-Centric Storage Sensor Networks". Submitted.
3. "Local Detection and Decomposition of Hotspots in Data-Centric Storage Sensor Networks". In preparation.
4. "Hotspot Avoidance in Data-Centric Storage Sensor Networks". In preparation.
5. "Throughput Competitive Scheduling with Session Guarantees in Packet Networks?". In preparation.
6. "Adsorption: A Label Propagation Algorithm For General Graphs". In preparation.
7. "Load-Balanced Data Collection for Next-Generation Sensornets". In preparation.

Patents

1. M. Aly. "TOLB: A Traffic-Oblivious Load-Balancing Protocol For Sensor Networks". Pending review.
2. M. Aly. "TOAC: A Traffic-Oblivious Admission-Control Protocol For Load-Balancing In Sensor Networks With Skewed Deployments". Pending review.
3. M. Aly. "TCOLB: A Two-Choices Oblivious Load-Balancing Protocol For Sensor Networks With Gaps". Pending review.
4. M. Aly and A. Youssef. "Two-Phase Query Processing To Decompose Query Hotspots In Sensor Networks". Pending review.
5. M. Aly and A. Youssef. "Three-Phase Query Processing To Decompose Query Hotspots In Sensor Networks". Pending review.
6. M. Aly and A. Youssef. "Query Partitioning To Decompose Query Hotspots In Sensor Networks". Pending review.
7. M. Aly, J. Zhao, and A. Youssef. "A Spatio-Temporal Data-Centric Storage Scheme For Real-Time Sensor Web". Pending review.
8. M. Aly, J. Zhao, and A. Youssef. "Adaptive Query Hotspots Decomposition in Spatio-Temporal Data-Centric Storage Schemes". Pending review.
9. M. Aly, J. Zhao, and A. Youssef. "Mixing Local And Spatio-Temporal Data-Centric Storage In Real-Time Sensor-Web". Pending review.

Graduate Courses

- **In Pittsburgh:** High-speed WANs, computer architecture, research topics in Computer Science (I and II), principles of database systems, design and analysis of algorithms, approximation algorithms (I and II) (CMU), advanced topics in data management, randomness and computation, graph theory (CMU), networks and matchings (CMU), linear programming (CMU), and convex polytopes (CMU).

- **In Alexandria:** Computer systems architecture, simulation techniques, directed readings in distributed and intelligent systems, distributed database systems, advanced data structures and algorithms, and fuzzy systems with applications.

Awards and Honors

The Andrew Mellon PhD Fellowship *Sept 2007 - April 2008*

Excellence Award *1998 to 2002*

Received for 5 consecutive years during the undergraduate study at Alexandria University.

Equivalence of the French High School *1997*

Alliance Francaise *1996*
Assez Bien.

Academic Activities and Memberships

Reviewer for multiple journals and conferences in the fields of algorithms, data management, and networking.

Active Member of both ACM and IEEE since 2005.

Personal

- Take pride in interpersonal skills: ability to adapt quickly to new colleagues and environments, relate team members together, and create positive group dynamics.
- Quick learner of algorithms, technology, and programming techniques. Open to learning new fields.
- Programming in C/C++, Java, and various scripting languages.
- Experience through non profit work in project management, strategic planning, and team building.
- Experience with mentoring kids, youth, and young adults.

Languages

- Arabic: Mother Tongue
- English: Fluent. Language of study during all years of undergraduate and graduate university studies (University of Alexandria, University of Pittsburgh).
- French: Fluent. Main language of study in primary, preparatory, and secondary school (College Saint-Marc d'Alexandrie).

Interests and Activities

- **Youth Work** scouts member for more than 15 years, coordinator for different youth programs in Alexandria, Egypt, Pittsburgh, PA, and Santa Clara, CA.
- **Social Activities** member of many social and intercultural organizations in Egypt, as well as in USA.