AHMED EL-ROBY

Assistant Professor - Carleton University
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EDUCATION

University of Waterloo *April 2018*
PhD Student in the Data Systems Research Group
King Abdullah University of Science and Technology *July 2011*
Master's of Science - InfoCloud Research Group
Faculty of Engineering, Alexandria University *June 2009*
Bachelor of Engineering - Computer and Systems Engineering Department

PUBLICATIONS

- Ahmed El-Roby, Ashraf Aboulnaga. UFeed: Refining Web Data Integration Based on User Feedback. *Proceedings of The ACM International Conference on Information and Knowledge Management (CIKM)*, pages 187–196, 2017.
- Ahmed El-Roby, Khaled Ammar, Ashraf Aboulnaga, Jimmy Lin. Sapphire: Querying RDF Data Made Simple (Demo). *Proceedings of the VLDB Endowment (PVLDB)*, volume 9, number 13, pages 1481-1484, 2016.
- Ahmed El-Roby. Utilizing User Feedback to Improve Data Integration Systems. *IEEE 32nd International Conference on Data Engineering Workshops (ICDEW)*, pages 206–210, 2016.
- Ahmed El-Roby, Ashraf Aboulnaga. ALEX: Automatic Link Exploration in Linked Data (Demo). *IEEE 32nd International Conference on Data Engineering (ICDE)*, pages 1322–1325, 2016.
- Ahmed El-Roby, Ashraf Aboulnaga. ALEX: Automatic Link Exploration in Linked Data. In *Proceedings of the ACM SIGMOD International Conference on Management of Data*, pages 1839–1853, 2015.
- Essam Mansour, Ahmed El-Roby, Panos Kalnis, Aron Ahmadia, Ashraf Aboulnaga. RACE: A Scalable and Elastic Parallel System for Discovering Repeats in Very Long Sequences. In *Proceedings of the VLDB Endowment (PVLDB)*, volume 6, number 10, pages 865-876, 2013.
- Ahmed El-Roby, Mohamed Fahmy, May Moussa, Moustafa Youssef. Nuzzer-D: Demonstrating Device-free Passive Localization for Wireless Environments. In *MobiCom*, 2008.

SELECTED PROJECTS

- **Heterogeneous Recommendation Based on Text Reviews (2019 - Present):** In this project, we utilize reviews written in natural language in one domain (e.g., books) to classify reviews in a different domain (e.g., movies). A model trained on a specific domain may perform poorly on another domain because the same word in different domains may express different meanings. We solve this problem using Mixup Regularized Adversarial Networks, in which we utilize a multinomial domain discriminator to minimize the divergences among multiple domains. This results in preventing the domain-specific features from infiltrating into the shared latent space.
- **Fine-Grained Benchmarking of Question Answering Systems (2019 - Present):** Evaluating QA systems has been ad-hoc and lacks informative feedback on the quality of the evaluated system. In this work, we do fine-grained evaluation of QA systems covering the natural language processing challenges in identifying entities of interest and relationships between them in the natural language question, how difficult to accurately map entities and relationships to entities and predicates in the knowledge graph, and how the shape structure of the queries correlates to the difficulty of answering the question.
- **Sapphire - University of Waterloo (2016 - 2017):** A system that helps users construct expressive SPARQL queries that represent their information needs without requiring having detailed knowledge about the queried data sets. These queries are then executed over public SPARQL endpoints from the Linked Open Data cloud. Sapphire guides users in the query writing process by showing suggestions of query terms based on the queried data, and by recommending changes to the query based on a predictive user model.

- **ALEX - University of Waterloo / Qatar Computing Research Institute (2014 - 2017):** A system that utilizes user feedback on the answers of queries issued over linked data with the goal of improving the quality of links between equivalent entities from different data sets. ALEX explores new links using Reinforcement Learning techniques, where it learns how to explore new links based on its interaction with real users.
- **UFeed (2014 - 2016) - University of Waterloo:** A system that utilizes user feedback on the answers of queries over web relational data sources that are automatically integrated in order to fix errors in the automatically created mediated schema of the data sources and the semantic mappings between each source and the mediated schema.
- **Peloton - Carnegie Mellon University (2016):** Peloton is an in-memory DBMS designed for real-time analytics. It can handle both fast ACID transactions and complex analytical queries on the same database. Peloton uses a single execution engine that is oblivious to the storage layout of data without sacrificing the performance benefits of the specialized systems. This obviates the need to maintain separate copies of the database in multiple independent systems.
- **RACE - University of Waterloo / King Abdullah University of Science and Technology (2012):** A system that is interested in finding maximal pairs and maximal repeats (types of repetitive structures) in very large strings that may not fit in memory. This system is deployed in parallel environments (multi core machine, cluster of machines, and supercomputers).
- **CLAW+ - IBM Research (2010):** A tool developed by IBM to help System Administrators better understand how to organize and track their tasks.
- **Distributed Query Processing Engine - King Abdullah University of Science and Technology (2010):** Building a distributed query engine that accepts a centralized query plan and converts it according to the current distribution of data over a cluster of machines with the help of an in-memory index.
- **MapReduce Prototype on BlueGene/P Supercomputer - King Abdullah University of Science and Technology (2009):** Building a prototype of the MapReduce framework that can be deployed on a BlueGene/P supercomputer. This prototype focuses on the applicability of MapReduce while avoiding the types of failures that can be encountered on other parallel infrastructures.
- **Nuzzer-D - Nile University (2008):** A device-free passive localization system that detects movements of objects without any devices attached to them. Nuzzer detects movements with high accuracy based on the changes in the signal strength transmitted from access points and received by one or more monitoring points.

TEACHING

- **Winter 2020:** COMP 5118 - Trends in Big Data Managament.
- **Winter 2020:** COMP 3005 - Database Management Systems.
- **Fall 2019:** COMP 3005 - Database Management Systems.
- **Winter 2019:** COMP 5900 - Recent Trends in Big Data Management.
- **Winter 2018:** TA for CS 251 Computer Organization & Design.
- **Fall 2017:** TA for CS 251 Computer Organization & Design.
- **Fall 2016:** IA for CS 251 Computer Organization & Design.
- **Spring 2015:** TA for CS 251 Computer Organization & Design.
- **Winter 2015:** TA for CS 251 Computer Organization & Design.
- **Fall 2012:** TA for CS 343 Concurrent and Parallel Programming.
- **Spring 2012:** TA for CS 251 Computer Organization & Design.
- **Winter 2012:** TA for CS 343 Concurrent and Parallel Programming.
- **Fall 2011:** TA for CS 245/SE 212 Logic and Computation.

STUDENTS

PhD Degree Students:

- Yingjun Dai.
- Abdelghny Orogat.
- Yuan Wu.

Master's Degree Students:

- Ritika Bhatia.
- Alex Gagnon.
- Xinyang Liu.
- Fathima Nizwana Yusuff.
- Jeffery Zhang.

Undergraduate Alumnus:

- James Fitzgerald (Summer 2019).
- Maxim Desjardins-Macfarlane (Winter 2019).
- Sharath Kunnanath (Winter 2019). First position after graduation: Mainframe Application Developer at Sun Life Financial.
- Gabe Sinhorin (Winter 2019). First position after graduation: Analyst/Solution Developer at Avanade.

HONORS AND AWARDS

- King Abdullah University for Science and Technology fellowship for Master's of science.
- Honored three times for academic excellence at Faculty of Engineering, Alexandria University.

INTERNSHIPS

Carnegie Mellon University *June 2016 - September 2016*
Intern
Qatar Computing Research Institute *January 2014 - November 2014*
Research Associate
IBM Thomas J. Watson Research Center *June 2010 - August 2010*
Software Engineer
Nile University *May 2008 - August 2008*
Research Assistant