Abdelrahman Hosny

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Summary

I try to optimize every process I encounter. In other words, my job is to find ways to do existing tasks in a more (sometimes dramatically) efficient way. To that end, I study the role of historical data in making better optimization decisions.

Education

2018-Present	***PhD*** – Computer Science, Brown University, Providence, RI.
	Interests: Constrained Optimization, Machine Learning; Learning to Optimize (L2O).
2019-2020	***Visiting Graduate Student*** – Computer Science and Engineering, UCSD, San Diego, CA.
2015-2016	***Master's*** – Computer Science and Engineering, University of Connecticut, Storrs, CT. GPA: A
	Thesis: Integrative analysis of heterogeneous genomics data for triple-negative breast cancer and high grade serous ovarian cancer. Online access: http://masters.abdelrahmanhosny.me
2016-2016	***Graduate Certificate in College Instruction***, a 9-credit program for graduate-level teaching, UConn
	Teaching Portfolio: http://teaching.abdelrahmanhosny.me
2009-2013	***Bachelor*** – Computer Science, Assiut University, Egypt. Rank: 1st GPA: 92.51%
2008-2009	*High School* – Ranked first in Egypt, Math Section. Grade: 99.6%

Publications Highlight

Full profile: http://scholar.abdelrahmanhosny.me

[2021] *A Hosny*, M Neseem, S Reda. Sparse Bitmap Compression for Memory-Efficient Training on the Edge. 2021 IEEE/ACM Symposium on Edge Computing (SEC).

[2021] *A Hosny*, S Reda. Characterizing and Optimizing EDA Flows for the Cloud. IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), and Design, Automation and Test in Europe (DATE).

[2020] E Przybytkowski, T Davis, *A Hosny*, J Eismann, UA Matulonis, GM Wulf, S Nabavi. An immune-centric exploration of BRCA1 and BRCA2 germline mutation related breast and ovarian cancers. BMC Cancer.

[2020] *A Hosny*, S Hashemi, M Shalan, S Reda. DRiLLS: Deep Reinforcement Learning for Logic Synthesis. 5th Asia and South Pacific Design Automation Conference (ASP-DAC).

[2020] *A Hosny*, AB Kahng. Tutorial: Open-Source EDA and Machine Learning for IC Design: A Live Update. 33rd International Conference on VLSI Design and 2020 19th International Conference on Embedded Systems (VLSID).

[2019] T Ajayi, VA Chhabria, M Fogaça, S Hashemi, *A Hosny*, AB Kahng, M Kim, J Lee, U Mallappa, M Neseem, G Pradipta, S Reda, M Saligane, SS Sapatnekar, C Sechen, M Shalan, W Swartz, L Wang, Z Wang, M Woo, B Xu. Toward an open-source digital flow: First learnings from the OpenRoad project. 56th Annual Design Automation Conference 2019 (DAC).

[2018] F Zare, *A Hosny*, S Nabavi. Noise cancellation using total variation for copy number variation detection. BMC bioinformatics.

[2017] F Zare, M Dow, N Monteleone, *A Hosny*, S Nabavi. An evaluation of copy number variation detection tools for cancer using whole exome sequencing data. BMC bioinformatics.

[2017] *A Hosny*, F Zare, S Nabavi. Varsimlab: A Docker-based Pipeline to Automatically Synthesize Short Reads with Genomic Aberrations. 8th ACM International Conference on Bioinformatics, Computational Biology, and Health Informatics.

[2016] *A Hosny*, P Vera-Licona, R Laubenbacher, T Favre. AlgoRun: a Docker-based packaging system for platform-agnostic implemented algorithms. Bioinformatics.

[2016] *A Hosny*. Integrative Analysis of Heterogeneous Genomics Data for Triple Negative Breast Cancer and High Grade Serous Ovarian Cancer. Master's Thesis.

Experience

June 2021 – Aug. 2021	***Research and Software Engineering Intern***, Cadence Design Systems, Remote, Inside USA
	I worked in the Genus R&D group researching and implementing techniques to improve Physical Layout Estimation (PLE) inside the synthesis engine. I contributed Tcl scripts to the main tool that analyze correlation between a generic PLE model and actual measurements from the downstream flow (P&R). I designed and implemented a GraphNN-based model to improve wire length predictions.

May 2020	***Co-founder***, ShipBlu, Cairo, Egypt. I co-founded ShipBlu with the goal of improving a centuries-old industry through machine-learning methods. The last-mile delivery service in Egypt lacks operational efficiency due to many overlooked optimization problems. ShipBlu reimagines core operations using combinatorial optimization methods, topped with machine-learning techniques to learn from existing data.
June 2019 – Sep. 2019	***Research Intern***, Microsoft Research, Redmond, WA, USA I worked at the Systems Research Group and Cloud Efficiency. My goal has been to study more efficient solutions that increase datacenters resource utilization and save costs for Azure clients. I worked at the Systems Research Group and Cloud Efficiency. My goal has been to study more efficient solutions that increase datacenters resource utilization and save costs for Azure clients.
June 2017 – Aug. 2018	***Research & Development Engineer***, xWARE Integrated Solutions, Assiut, Egypt. I collaborated with the business team to analyze clients' needs and propose technology solutions to the market needs. In addition, I researched and executed best practices in software development processes. Some of my contributions included: writing well-researched technical proposals that address a specific need; directly interacted with clients and stakeholders to communicate the status of ongoing projects; designed and implemented a DevOps pipeline that improved team productivity and reduced time-to-production releases; led a small software team executing an end-to-end SDLC.
Jun. 2017 – Aug. 2018	***Teaching Assistant***, Computer Science, Assiut University, Egypt Courses Taught: Computer Architecture, Programming with Assembly for x86 architectures.
Jan. 2016 – May. 2017	***Research Assistant***, Center for Quantitative Medicine, UConn Health, CT, USA I collaborated with an interdisciplinary research team with the goal of advancing quantitative medicine and health care. My role has focused on building support tools and computational platforms for mathematical modeling and simulation of biomedically relevant systems. Some of my contributions included: AlgoPiper: a web-based software that enables building pipelines and workflows of independent computational algorithms through a drag-n-drop graphical user interface; TURING: A crowd-sourced platform for algorithms and analysis pipelines focused on time- and state discrete dynamical systems. It features an easy way for developers to publish their own algorithms and link them with others to create workflows for the analysis and use of systems within mathematics and in applications to other fields such as biology and engineering.
Jan. 2015-Dec. 2016	***Teaching Assistant***, Computer Science and Engineering, University of Connecticut, CT, USA Courses: Statistical Analysis of Computer Systems, Algorithms & Complexity.
Summer 2016	***Research Intern***, Nabavi Lab, University of Connecticut, CT, USA My role was to develop novel computational methods to identify candidate biomarkers of drug resistant in heterogeneous cancer. I got trained on analyzing large heterogeneous datasets of human DNA and RNA. My work during this internship inspired my Master's thesis project. In addition, I have developed a simulation tool to augment Copy Number Variation (amplifications/deletions) in whole genome sequencing in addition to targeted sequencing.
Jan. 2015-Dec. 2015	***Research Assistant***, Center for Hardware Assurance, Security and Engineering, Electrical and Computer Engineering, University of Connecticut, CT, USA I have worked on a Big Data project sponsored by Comcast that analyzes and predicts anomalous user behavior through analytic and learning algorithms. I have utilized different Python packages to build user models and predict anomalies followed by data visualization. I have also used Apache Spark to transform our models into ones that are ready for Big Data analysis (in terms of volume and velocity).
Summer 2015	***Research Intern***, Center for Quantitative Medicine, UConn Health, CT, USA I have been the main contributor to [AlgoRun](#) open source platform. AlgoRun is a Docker-based container template for computational algorithms. Using AlgoRun, we have been able to build [AlgoPiper](#) to enable independent software modules and algorithms work together.
Oct. 2013-Dec. 2014	***Teaching Assistant***, Computer Science, Assiut University, Egypt Courses: Introduction to Object Oriented Programming using Java, Compilers Theory

Summer 2012	**_Software Engineering Intern_**, ITWorx, Cairo, Egypt

Project: School Management System using Microsoft SharePoint technology.
I learned Microsoft SharePoint technology, and developed an automated solution for a reporting system using .NET with SharePoint 2010.

Honors and Awards

2019	Richard Newton Young Student Fellowship, Design Automation Conference (DAC'19), Las Vegas, NV, USA
2015	UConn Graduate Student Intern of the Year Honorable Mention, University of Connecticut, USA
2013	Top 10 Debaters Medal and Award, 2nd International Universities Arabic Debating Championship, Al Doha, Qatar
2010	One of Top 10 Math Competitors, AUC Math Competition, Cairo, Egypt.
2009	Coca-Cola Education Award, Assiut Governorate shield, Assiut Municipal Council shield
	Teachers Association in Assiut shield

Community

2022	External Reviewer, IEEE Transactions on Computer Aided Design
2021	External Reviewer, IEEE Transactions on Computer Aided Design
2020	External Reviewer, IEEE Design and Test
2019 – 2020	External Reviewer, AMIA 2019 Annual Symposium
2010 – Present	A student member in IEEE and ACM

Featured Projects

Full Portfolio: https://github.com/abdelrahmanhosny?tab=projects

2019	DRiLLS – Brown University.
	A Deep Reinforcement Learning Framework for Logic Synthesis [link: https://github.com/scale-lab/DRiLLS]
2018	OpenROAD Flow – Brown University funded by DARPA
	A cloud-based application to run a fully automated hardware design flow [link: https://theopenroadproject.org/]
2017	MeSHgram – NCBI Hackathon, NLM, NIH, Washington DC [link: https://github.com/NCBI-Hackathons]
	A web-based tool to visually browse co-occurrence of MeSH terms in PubMed.
2016	_Integrative Analysis of heterogeneous genomics data for TNBC,_ Master's Thesis
	Identifying candidate biomarkers for drug resistance in heterogeneous breast cancer data.
2016	_CNV-Sim_, main contributor [link: https://nabavilab.github.io/CNV-Sim]
	Simulating copy number variations in whole genome and targeted sequencing.
2016	_TURING_, main contributor [link: http://www.discretedynamics.org/]
	A crow-sourced platform for algorithms focused on time- and state-discrete dynamical systems.
2016	_AlgoPiper_, main contributor [link: http://algopiper.org/]
	A visual tool to create pipelines based on AlgoRun packaging system.
2016	_Deep learning models on Saccharomyces Cerevisiae_, main contributor
	[link: http://abdelrahmanhosny.github.io/DL-Cerevesiae/]
	Confirming DNA origins of replication in Cerevisiae genome using deep learning models.
2015	_AlgoRun_, main contributor [link: http://algorun.org/]
	A Docker-based packaging system for platform-agnostic implemented algorithms.

Conferences and Certification

January 2020	_Presenter_, ASP-DAC'20, Beijing, China
January 2020	_Tutorial Speaker_, VLSID'20, Bangalore, India
August 2017	_Presenter,_ ACM BCB'17, Boston, MA.
April 2016	_Speaker_ at Docker Boston Meetup. Talk link: http://bit.ly/algorun-talk
March 2016	_Mentor_ at Docker Birthday #3, Boston, MA
January 2013	International Software Testing Qualifications Board (ISTQB) – Foundation

Volunteering

Feb. 2016 - May 2017   *Webmaster* at IEEE Connecticut Section
                        Activities: maintain and update all website content of IEEE CT Section.
November 2013   *Team Coach* at ACM Arab Collegiate Programming Contest (ACPC), Egypt
                        Activities: mentored a team of programmers to solve programming challenges
Aug. 2012 - May 2013   *Microsoft YouthSpark Leader*, Microsoft Citizenship, Egypt
                        Activities: planned social projects that promote entrepreneurship
Jan. 2011 - May 2013   *Microsoft Student Partner* at Microsoft Egypt
                        Activities: founded and lead Microsoft tech-club at Assiut University
                                delivered technical sessions evangelizing Microsoft technologies
                                contributed to Microsoft Windows 8 Launch in Egypt
                                competed in Microsoft Imagine Cup 2012
Aug. 2011 - May 2012   *President*, Alashanek Ya Balady for Sustainable Development, Assiut Franchise
                        Activities: started R&D processes to support poor people in the city
                                formulated youth development and micro loans programs
Aug. 2010 – May 2011   *Scientific Committee Head*, Student Union, Faculty of Computers & Information
                        Activities: contributed to a country-wide conference for CS students.
                                delivered technical sessions about web development