Omar Aaziz

Resume

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Citizenship: USA

Education

2012–2018 **Doctoral of Philosophy of Computer Science**, *New Mexico State University*, Las Cruces, NM.

2000–2002 **Masters of Computer Science**, *University of Baghdad*, Baghdad, Iraq.

1996–2000 **Bachelor of Computer Science**, *Al-Rafidain University*, Baghdad, Iraq.

Research Experience

2018–Present **R&D Computer Scientist**, Sandia National Laboratories, Albuquerque, NM.

- Explored several machine learning techniques to predict and diagnose performance anomalies in production HPC applications
- Developed methodologies use machine learning to predict the overall performance of running scientific applications instantly to improve Sandia supercomputing fertility
- Performed variance thresholding and cross-correlation on terabytes of time-series HPC system data for dimensionality reduction and identification of performance botelnecks
- Developed analytics for network intrusion detection through Sandia-designed software in coordination with government agencies
- Lead a team of four undergraduate and graduate students at New Mexico State University to design a GPU analytic framework to detect performance deterioration in heterogeneous applications
- Applied data analytics to characterize communication patterns to find the behavior relationship between real and proxy applications and discover their correspondence or divergence
- Advanced monitoring and analysis capabilities for HPC systems by incorporating Lightweight Distributed Metric Service (LDMS), a supercomputer metric collection service, into Sandia testbeds
- Organized, led, and presented at a data analytics meeting between members of Sandia, Los Alamos, and Lawrence Livermore National Laboratories centered on HPC systems
- Collaborated with scientists from Oak Ridge National Laboratory as a member of the ECP project, to improve the quality of current scientfic applications and maximize the benefit received from their use

2016–2018 **Intern**, Sandia National Laboratories, Albuquerque, NM.

- Designed two efficient algorithms to identify scientific applications execution phases to predict the runtime behavior and progress accurately.
- Created a data-driven methodology for characterizing the relationship between real and proxy applications based on terabytes of runtime data from both and then used data analytic techniques to find their correspondence

2012–2016 **Research Assistant**, New Mexico state university, Las Cruces, NM.

- Studied the behavior of parallel scientific applications using statistical and numerical techniques
- Investigate whether there is a causal relationship between the presence of customizability technology (i.e., a technology that allows individuals/websites to tailor the information environment according to the user's preferences) and selective political exposure
- Designed a solar images search engine that can search hundreds of millions of images stored in a data center efficiently

Professional Experience

2009-2010 **Software Engineer**, NASA, Las Cruces.

- Enhanced the Helioviewer website
- Created a similarity algorithm to find similar movies on the fly
- Created new API's to locate new movies link using Ajax
- Website http://www.helioviewer.org/

2010-2012 **Web Developer**, Citi Group, Dallas.

- Developed a large business mortgages foreclosure application using C#
- Developed a thorough understanding of business specifications and produced financial applications
- Partnered with various business units to define requirements, budgets, and timelines and recommend cost-efficient solutions
- Provided status on the progress of the development effort to develop management
- Maintained documentation standards and versioning control

2009-2010 **Software Engineer**, Teleplan, Dallas.

- Developed a laptops repair tracking system using C# with SQL server
- Responsible for providing customer support
- Prepared functional and technical design documents
- Provided technical project leadership experience in various aspects of the project lifecycle maintenance

2003-2009 **Project Manager**, Madarat Software, Baghdad, Iraq.

- Developed an online strategy that supports the company's overall goals and oversaw all aspects of its implementation
- Designed high-end web apps for clients Used technologies such as ASP.NET (WebForms and MVC), CSS C#, jQuery
- Identified opportunities for growth and executing strategies that take advantage of these opportunities
- Successfully managed a team of 15 software engineers
- Completed six-month consulting contract to design the software architecture and processes needed to migrate databases for an industry-leading mortgage lending software products to operate on the Microsoft .NET Framework. The new architecture supports aggressive new product rapid application development (RAD)

Teaching & Mentoring Experience

2019-Present **Adjunct Faculty**, University of New Mexico, Albuquerque, the CS485/585 class had 36 undergraduate students and 24 graduate students.

Course:

- Computer Networks

2016-2017 **Graduate Mentor**, New Mexico State University, Las Cruces.

- Mentored one master student in the computer science department to visualize and analyze large data collections using MEAN stack

2014-2016 **Lecturer**, Dona Ana Community Collage/Business & Information Systems, Las Cruces, Taught multiple courses, each class had around 25 students.

Courses:

- Database Management Systems
- Java programming
- Introduction to Computer Science (online)
- Computer Literacy

2013-2016 **Teaching Assistant**, New Mexico State University, Las Cruces, I was a teaching assistant for multiple courses, each course had 30 to 40 undergraduate and/or graduate students.

Courses:

- Database Management Systems I
- Database Management Systems II
- Computer Architecture
- Java Programming
- Software Engineering
- Introduction to Computer Science
- Computer Literacy

2003-2009 **Faculty**, University of Baghdad, Baghdad, Iraq, Taught multiple courses, each class had around 40 students and mentored 22 undergraduate CS major students.

Courses:

- Software Engineering
- Computer Architecture
- C Programing
- Artificial Intelligence
- Database Management System
- Fundamentals of Web Services
- C# .NET Programming

Publications

[1] **Aaziz, Omar** and Cook, Jeanine and Cook, Jonathan and Vaughan, Courtenay, 2019, September. Proxy or Imposter? A Method and Case Study to Determine the Answer. In 2019 IEEE Workshop on Monitoring and Analysis for High Performance Computing Systems Plus Applications (HPCMASPA). IEEE.

[2] **Aaziz, Omar** and Cook, Jeanine and Cook, Jonathan and Vaughan, Courtenay, 2018, November. Exploring and Quantifying How Communication Behaviors in Proxies Relate to Real Applications. In 2018 IEEE/ACM Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems (PMBS) (pp. 12-22). IEEE.

[3] **Aaziz, Omar** and Cook, Jeanine and Cook, Jonathan and Juedeman, Tanner and Richards, David and Vaughan, Courtenay, 2018, September. A Methodology for Characterizing the Correspondence Between Real and Proxy Applications. In 2018 IEEE International Conference on Cluster Computing (CLUSTER) (pp. 190-200). IEEE.

[4] **Aaziz, Omar** and Cook, Jonathan and Tanash, Mohammed, M., 2018, September. Modeling Expected Application Runtime for Characterizing and Assessing Job Performance. In 2018 IEEE International Conference on Cluster Computing (CLUSTER) (pp. 543-551). IEEE.

[5] Richard, David and **Aaziz, Omar**, et al. "FY18 Proxy App Suite Release." Milestone Report for the ECP Proxy App Project. No. LLNL-TR-760903. Lawrence Livermore National Lab.(LLNL), Livermore, CA (United States), 2018.

[6] Dylko, Ivan and Dolgov, Igor and Hoffman, William and Eckhart, Nicholas and Molina, Maria and **Aaziz, Omar**, 2018. Impact of customizability technology on political polarization. Journal of Information Technology & Politics, 15(1), pp.19-33.

[7] **Aaziz Omar**. "Application Monitoring in the HPC Production Environment for Improved Understanding of Production Execution." PhD diss., New Mexico State University, 2018.

[8] **Aaziz, Omar** and Panthi, Ujjwal and Cook, Jonathan, 2017, September. YAViT (Yet Another Viz Tool): Raising the Level of Abstraction in End-User HPC Interactions. In 2017 IEEE International Conference on Cluster Computing (CLUSTER) (pp. 814-817). IEEE.

[9] Dylko, Ivan and Dolgov, Igor and Hoffman, William and Eckhart, Nicholas and Molina, Maria and **Aaziz, Omar**, 2017. The dark side of technology: An experimental investigation of the influence of customizability technology on online political selective exposure. Computers in Human Behavior, 73, pp.181-190.

[10] Tanash, Mohammed and Ghazanfari, Nasim and **Aaziz, Omar** and Cook, Jonathan, J., 2016, May. Automatically Instrumenting Scientific Applications to Produce Heartbeat Events. In 2016 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW) (pp. 1678-1686). IEEE.

[11] **Aaziz, Omar** and Cook, Jonathan and Sharifi, Hadi, 2015, September. Push me pull you: Integrating opposing data transport modes for efficient hpc application monitoring. In 2015 IEEE International Conference on Cluster Computing (pp. 674-681). IEEE.

[12] Sharifi, Hadi and **Aaziz, Omar** and Cook, Jonathan, 2015, February. Monitoring HPC applications in the production environment. In Proceedings of the 2nd Workshop on Parallel Programming for Analytics Applications (pp. 39-47). ACM.

Peer Reviewed Activities

Cluster Computing (CLUS) Journal

High Performance Extreme Computing Conference (HPEC)

International Workshop on Modeling and Simulation of and by Parallel and Distributed Systems (MSPDS)

Projects

YAViT	An HPC application performance visualization tool that presents views organized by applications
ProMon	A tool for production side monitoring of scientific applications
LDMS	Contributed in LDMS development, a Sandia National Laboratory monitoring tool
AppInfo	Scalable parallel clustering library, used in LDMS monitoring tool
CustomNews	A customized website application reflects Google news
Solarstorm	A solar data center search engine web interface, provides fast retrieve of sun images
Helioviewer	Solar and heliospheric image visualization tool

Awards & Honors

2017	Linux Foundation Training (LiFT) Scholarship in the category of SysAdmin Superstars
2017	J. Mack Adams Endowed Scholarship
2013-2016	Student with excellent records fellowship (GAANN) – Computer Science Department
2015, 2016	Graduate College Conference Travel Grant
2000	Qualified by graduating with honors and ranking 9th among computer science major

Memberships

IEEE, ACM

Community Service

2019 **Mentor**, IEEE Cluster19 conference, a member of the studetn mentoring program.

2018 **Students Mentor**, SC18 conference, a member of the Mentor-Protege program.

2017 **DevOps**, SCinet, a member of 20 volunteers served to build the world's fastest temporary network for the Super Computing 2017 Conference.

2013-2017 **CSGSO President**, New Mexico State University, elected as the president of the Computer Science Graduate Student Organization (CSGSO), representing the graduate students in the computer science department.

2016 **Volunteer**, Lynn Middle School, Las Cruces, taught Arduino programming to 23 students.

2014-2015 **Volunteer**, University Hills Elementary School, Las Cruces, taught Lego robotics programming to 35 students and participated in the state competition.