Omar Aaziz

Resume

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Citizenship: US citizen

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.

Technical skills

- Linux OS: Red Hat Enterprise, Fedora, Ubuntu
- Computational programming and machine learning with R and Python
- Performance Tools [Intel Advisor, HPCToolkit, VTune]
- Statistical Analysis and inference [Regression, Hypothesis testing]
- Programming (C/C++, Perl, Python, Bash, Java, C# ASP.NET)
- Multiprocessor and GPU Programming MPI, OpenMP, CUDA
- Shared-memory parallel programming, debugging, performance tuning
- Numerical algorithms: research, development and exposition
- Batch Schedulers (Torque, Slurm)
- Lightweight Distributed Metric Service (LDMS) framework
- Object-oriented design, analysis, and programming (OOA/OOD/OOP, UML)
- Relational Database Systems (SQL Server, SSIS, SSRS, MySQL)
- Data processing and querying with SQL
- Collaborative computing with GitHub and Git
- Agile Design
- Strong general management, negotiation, inter-personal, communication and team building skills

Research and Industry Experience

2018–Present **Sr. Software Engineer**, Sandia National Laboratories, Albuquerque, NM.

- Supporting Sandia National Laboratories High-Performance Computing strategic roadmap
- Co-developing the LDMS monitoring framework, which has a potential saving of the computing resources in HPC
- Member of the ECP project, collabirating with 5 National Labs to imporve the proxy applications algorihm performance
- Working with 12 researchers from Sandia national labs and 4 universities to design and implement a new HPC end-to-end monitoring methodologies
- Collaborating with researchers from Sandia Labs and NMSU to understand how well a proxy application predicts the comprehensive performance of its parent scientific application
- Evaluating current and future HPC system architectures performance
- System administration and optimizing applications in a Linux-based HPC enviroment
- Created several machine learning and a statical modules using python and R
- Built and ran around 35 scientific applications from various scientific fields on different architecture HPC machines

2017–2018 **Year-round Intern**, Sandia National Laboratories, Albuquerque, NM.

- Advanced the application monitoring capability for the LDMS monitoring framework to better understand the scientific application behavior
- Created data-driven methodology for characterizing the relationship between real and proxy applications based on collecting runtime data from both and then using data analytics to find their correspondence and divergence using LDMS
- Developed a machine learning and a statical module to predict application runtime using hardware counters in large scale production clusters

2014–2018 **HPC Engineer**, New Mexico state university, Las Cruces, NM.

- Administrated the Computer Science department supercomputer
- Measure and monitor overall system performance, usage, availability, capacity and health using LDMS monitoring framewrok
- Supported the department production cluster and managed nearly 100 active users with 20000 jobs annually
- Managed builds, configurations, deployments, and troubleshot of nearly 120 parallel scientific applications and benchmarks
- Addressed problems in users parallel applications to gain approximately 15% increase in application runtime performance
- Deployed 23 compilers, 12 third party tools, and packages and make it available to the cluster users using modules
- Developed CUDA applications to simulate the temperature distribution from a central source
- Developed an MPI+OpenMP application to simulate the water flow under the earth surface
- Developed nearly 12 MPI applications to solve variety of scientific problems
- Created approximately 35 R-scripts to analyze large amount of data
- Created around 100 scripts for automation, monitoring and testing using Shell, Python, and Perl
- Managed one MongoDB, and two SQL databases with 2 TB of data
- Initialized and configured newly installed 120 TB storage using RAID 6
- Initialized and configured newly installed 16 TB storage using RAID 1

2015–2017 **Research Assistant**, New Mexico state university, Las Cruces, NM.

- Funded by Sandia National Laboratories
- Studied the behavior patterns of parallel scientific applications using statistical and numerical techniques
- Created a new mechanism to collect hardware counters from applications running on production clusters with less than 1% runtime overhead to discover performance drawbacks.
- Desing and implemented a framework to automatically monitor and predict the performance, load balance of parallel applications

Summer 2016 **Summer Intern**, Sandia National Laboratories, Albuquerque, NM.

Developed a low overhead monitoring framework to evaluate application performance in production machines using event data.

2014–2015 **Research Assistant**, New Mexico state university, Las Cruces, NM.

- Funded by Sandia National Laboratories
- Designed a production monitoring framework that is capable of collecting performance data from applications run on large scale clusters. Also measured the impact of the message size on the MPI applications communication performance

2013–2017 **Research Assistant**, New Mexico state university, Las Cruces, NM.

- Funded by Sandia National Laboratories
- Investigate whether there is a causal relationship between the presence of customizability technology (i.e., technology that allows individuals/websites to tailor the information environment according to user's preferences) and political selective exposure

2012–2013 **Research Assistant**, New Mexico state university, Las Cruces, NM.

Designed of solar images search engine than can search hundred of millions of images stored in a datacenter efficiently

2009-2014 **Software Engineer**, Alleqa Elementary School, Baghdad, Iraq.

- This was a 100% remote work position
- Designed and developed ALLEQA Elementary School website
- Used ASP 3.5, C# and SQL 2008 DB (http://www.alleqa.com/)
- Develop application technology roadmaps
- Developed thorough understanding of School specifications and produce

2010-2012 **Software Engineer**, Citi Group, Dallas.

- Developed a large buisness mortgages foreclosure application using C#
- Developed a thorough understanding of business specifications and produce 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 development management
- Maintained documentation standards and versioning control

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

- Develop Laptops repair tracking system using C# with SQL server
- Desktop and laptop installation and problem resolution in a Windows XP environment

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

- Developed an online strategy that supports the company's overall goals and oversee all aspects of its implementation
- Wrote high-end web apps for clients Used technologies such as ASP.NET (WebForms and MVC), CSS C#, jQuery
- Identified opportunities for growth and execute strategies that take advantage of these opportunities
- Successfully managde team of 15 software engineers
- Managed website development to incorporate new features and functionality
- Alerted colleagues to emerging technologies or applications and the opportunities to integrate them into our operations and activities
- Developed and manage the organizationâĂŹs entire online budget, including website development and maintenance, outreach and promotion, personnel and operations
- Developed around 30 applications for health and financing companies contracted with Madarat with 2 years maintenance
- Develop multiple websites using PHP, Php cake with MySQL.
- Develop multiple websites using C#, ASP with SQLserver or MySQL.
- Successfully completed six month consulting contract to design the software architecture and processes needed to migrate Kirkuk Databases industry -leading mortgage lending software products to operate on the Microsoft .NET Framework. The new architecture supports aggressive new product rapid application development (RAD).
- Supporting all existing Kirkuk Database products using PHP and MySQL.
- Specified an effective migration strategy from FoxPro to C#/.NET/SQL Server.
- Proposed guidelines for proper use of off-shore development resources.

Teaching and Mentoring Experience

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 MongoDB and Node.js

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

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.

2003-2009 **Lecturer**, University of Baghdad, Baghdad, Iraq, Taught multiple courses, each class had around 45 students.

2003-2009 **Undergraduate Mentor**, University of Baghdad, Baghdad, Iraq.

- Mentored 22 undergraduate students in the computer science department to implement several Software Engineering projects.
- Guided the students in preparation and presentation of research findings.

Publications & Posters

[1] Hadi Sharifi, **Omar Aaziz**, and Jonathan Cook. "Monitoring HPC applications in the production environment." Proceedings of the 2nd Workshop on Parallel Programming for Analytics Applications. ACM, 2015.

[2] **Omar Aaziz**, Jonathan Cook, and Hadi Sharifi. "Push me pull you: Integrating opposing data transport modes for efficient hpc application monitoring." Cluster Computing (CLUSTER), 2015 IEEE International Conference on. IEEE, 2015.

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

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

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

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

[7] Ivan Dylko, Igor Dolgov, William Hoffman, Nicholas Eckhart, Maria Molina, and **Omar Aaziz**. "Impact of customizability technology on political polarization." Journal of Information Technology and Politics 15.1 (2018): 19-33.

[8] **Omar Aaziz** and Jonathan Cook. "HPC Production Job Quality Assessment." Poster session presented at the Super Computing 2017, Denver, CO.

[9] David Richard, **Omar Aaziz**, 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.

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

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

[12] **Omar Aaziz**, Jeanine Cook, Jonathan Cook, and Courtenay Vaughan. "Exploring and Quantifying How Communication Behaviors in Proxies Relate to Real Applications." In Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems (PMBS18).

Peer Reviewed Conference Proceedings

High Performance Extreme Computing Conference (HPEC)

International Conference on Parallel Processing (ICPP)

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

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.
2014-2017	**President**, New Mexico State University, Served as the president of the computer science graduate student organization 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.
2013-2014	**Vice President**, New Mexico State University, Served as the vice president of the computer science graduate student organization representing the graduate students in the computer science department.