

Bibrak Qamar Chandio

Center for Research in Extreme Scale Technologies (CREST)
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CAREER SUMMARY

System software and application software developer for scalable high performance computing who has worked on both ends of scalable software development from design and implementation of runtime systems (like MPI) to implementation of scientific and data applications on clusters, shared memory, GPU and PGAS platforms.

EDUCATION

- Indiana University**, Bloomington, IN, USA May-2021 (expected)
Doctor of Philosophy in Intelligent Systems Engineering
Minor: Scientific Computing
- Indiana University**, Bloomington, IN, USA May-2016
Master of Science in Computer Science
Under Fulbright Scholarship
- National University of Sciences and Technology**, Islamabad, Pakistan May-2011
Bachelor of Science in Information Technology
Under Prime Minister's National ICT Scholarship

Main Technical AREAS

HPC, Parallel Computing, MPI, Java MPI, Scientific Computing, Graph Processing, GPU Computing

WORK EXPERIENCE

Center for Research in Extreme Scale Technologies

Indiana University, Bloomington USA Aug 2016 - Present
Graduate Research Student

- Application development on top of dynamic adaptive runtime systems for Exascale computing, in particular HPX (<https://hpx.crest.iu.edu/>).
- Example: Molecular Dynamics application on top of HPX <https://hpx.crest.iu.edu/applications>
- Performance evaluation and tuning for applications on top of HPX.
- Researching Graph processing under an asynchronous event driven (active message like) execution regime.

HPC Lab, National University of Sciences and Technology, Islamabad, Pakistan Aug 2013 - June 2014
Developer

- Developer of an open source Java message-passing library called MPJ Express <http://mpjexpress.org> that allows application developers to write and execute parallel applications for multicore processors and compute clusters/clouds.
- Contributed in design, development, testing and performance tuning of new communication devices for MPJ Express. In particular, developed a native device to enable MPJ Express to use native MPI libraries for communication and a hybrid device to exploit hybrid parallelism transparently.
- Published a paper in ICCS 2014.
- Published a paper in the Journal of Parallel Computing 2015.

HPC Lab UAE University, Al Ain, UAE Oct 2011 - May 2013
Assistant Researcher

- Oil Reservoir Simulation on GPUs and MPI based clusters.

- Design and evaluated scheduling algorithms for divisible load applications in heterogeneous cloud environments.

TECHNICAL SKILLS

Programming Languages/models: C, CUDA, Maxeler DataFlow, Java, MPI, OpenMP, R

Scripting Languages: bash script

Databases: mySQL

Development Tools & Editors: vi, netbeans, eclipse

Operating Systems: Linux, OS X, Windows

JOURNAL PAPERS

Ansar Javed, **Bibrak Qamar**, Mohsan Jameel, Aamir Shafi, Bryan Carpenter **Towards Scalable Java HPC with Hybrid and Native Communication Devices in MPJ Express**, [International Journal of Parallel Programming, 2015, pp 1-31](#)

CONFERENCE PAPERS

Bibrak Qamar, Ansar Javed, Mohsan Jameel, Aamir Shafi and Bryan Carpenter **Design and Implementation of Hybrid and Native Communication Devices for Java HPC**, [Procedia Computer Science 29 \(2014\) 184–197](#)

WORKSHOP PAPERS

Fadi N. Sibai, Saadullah Mohammad, Hashir Karim Kidwai, **Bibrak Qamar**, Falah Awwad: **Parallel Implementation and Performance Analysis of a 3D Oil Reservoir Data Visualization Tool on the Cell Broadband Engine and CUDA GPU**, [HPCC-ICESS 2012](#): 970-975

SOME ACADEMIC PROJECTS

- Implemented a **parallel construct** called *let-par* for a basic scheme like functional programming language. *let-par* makes parallel programming easy by removing the dirty work of exposing, managing and tuning parallelism from the programmer. *let-par* executes let bindings in parallel using POSIX threads, which aims to make the language portable across system software and hardware. *let-par* is implemented in such a way that it also exploits nested parallelism from within *let-pars*, think of a recursive function that calls *let-par*.
 - Poster: homes.soic.indiana.edu/bchandio/source/Poster_LPL.pdf
- Ported Molecular Dynamics application on to dynamic adaptive runtime system (HPX) during my masters in Computer Science. <https://hpx.crest.iu.edu/applications>
- My Undergraduate Final Year Project was **Implementation and Evaluation of Scientific Simulations on HPC Architectures**. My main job was to parallelize **Conjugate Gradient** Method (an iterative method for solving System of Linear Equations) on Distributed Memory machines, Shared Memory machines and Accelerators (GPUs) and analyze the performance, cost and efficiency.
 - Report/Documentation: <http://bit.ly/2d9LCAN>
 - Poster: <http://bit.ly/2dF0D2u>
 - Demo Simulation: http://www.youtube.com/watch?v=J6J0T00Q_MQ

HONORS & AWARDS

- Recipient of the **Fulbright** Masters Scholarship 2014 (MS Computer Science from Indiana University Bloomington, IN, United States)
- Recipient of the merit based **Prime Minister's National ICT Scholarship** for undergraduate studies at NUST for 4 years of BS in IT.

- Participated as student in **2nd International Summer School on High Performance, Grid/Cloud Computing** held in UAE University Al Ain UAE.
- Participated in **Microsoft Imagine Cup 2010**. Our idea qualified to semifinal. The theme was to use technology to help solve world's toughest problems. The idea was "**Secure Donation**", a system that can track where the donation is being spent. This will ultimately encourage donors and make charities more transparent.