NAVEEN N RAVICHANDRASEKARAN

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SUMMARY

Professional Software Engineer with experience in the general areas of parallel and distributed computing. Specifically, my technical skills focuses in the following areas: (i) parallel programming models and runtime systems (MPI and PGAS models like OpenSHMEM, Global Arrays, and Coarray Fortran); (ii) parallel computing architectures, and (iii) high-speed interconnects

EXPERIENCE

Hewlett Packard Enterprise 01/01/2020 - present
Systems/Software Engineer - Programming Environment Message Passing Toolkit *Saint Paul, MN*

Cray, Inc 12/26/2015 - 12/12/2019
Software Engineer - Programming Environment Message Passing Toolkit *Saint Paul, MN*

- HPC and parallel programming runtime optimizations for HPE/CrayHPE/Cray supercomputer and cluster hardware to be utilized by specific customers like U.S government and commercial petroleum industries
- Work specifically on Cray software stacks like Cray MPICH, Cray SHMEM, and Global Arrays
- Participate and represent HPE/Cray in OpenSHMEM standards committee

Cray, Inc 05/18/2015 - 12/25/2015
Intern - Programming Environment Message Passing Toolkit *Saint Paul, MN*

- Research, Prototype, and Implement new features in Cray SHMEM programming library
- Optimize Global Arrays library for NAMD and NWChem Chemistry applications

University of Houston 09/14/2013 - 05/15/2015
Research Assistant - HPC Tools *Houston, TX*

- Research Assistant to Dr.Barbara Chapman(Chair, Computer Science & Mathematics(CSM) Group - Brookhaven National Laboratory)
- Research and explore strategies for runtime optimizations, and compiler-tools interactions for large-scale parallel systems using OpenSHMEM and Coarray Fortran programming models

Cognizant Technology Solutions 06/23/2011 - 07/12/2013
Programmer Analyst *Chennai, India*

- Prepare parallel test framework to validate bank statements for one of the leading financial services company in their Asset Services Project

KEY ACTIVITIES

1. *OpenSHMEM standardization Effort*, Participate and represent HPE in OpenSHMEM standards committee. `http://openshmem.org/`.

EDUCATION

University of Houston, Main Campus *December 2015*
M.S. in Computer Science - Specialization in Parallel & Distributed Systems

Anna University, India *May 2011*
Bachelors in Engineering - Electrical & Electronics Engineering

TECHNICAL STRENGTHS

Programming Languages	C/C++, Fortran, Python
Parallel Programming Models	OpenSHMEM, MPI, Coarray Fortran, OpenMP
Network Libraries	DMAPP, Verbs, Libfabric
System Architectures	Aarch64, x86_64, GPU
Architectures	Cray Supercomputers, & Clusters, Intel MIC

AWARDS AND ACCOMPLISHMENTS

1. *Best Paper Award*, 8th International Conference on Partitioned Global Address Space Programming Model(PGAS 2014).
2. *Graduate Assistant Tution Fellowship*, September 2013 - May 2015.
3. *Best Undergraduate Student Project*, Mepco Schlenk Eng. College, Anna University, India, 2011.

PROJECTS

Current Projects

1. **Cray OpenSHMEMX**
   - Cray OpenSHMEMX, a new OpenSHMEM library implementation that supersedes the existing production ready Cray SHMEM library on future exascale Cray Shasta architectures
   - Design and develop Cray OpenSHMEMX from scratch with support for different transport layers including DMAPP, XPMEM, and Libfabric
2. **Cray MPICH**
   - Create an optimized message matching layer for the MPI implementation
   - Optimize GPU-awareness in the MPI implementation

Past Projects

1. **Cray SHMEM**
   Project description: Cray SHMEM is a production quality SHMEM implementation on different Cray platforms with OpenSHMEM standards compliant. **My Contributions:** I am particularly involved in maintaining library along with implementing new features as per the OpenSHMEM standards, also propose and prototype new features like Communication Contexts, Symmetric Memory Partitions and Teams(PE-Subsets).
2. **Cray Global Arrays(Cray-GA) ComEx-DMAPP**
   Project description: Global Arrays is a PGAS library from Pacific Northwest National Laboratory (PNNL). **My Contributions:** I was involved in optimizing and maintain the ComEx - DMAPP communication layer.
3. **OpenSHMEM Reference Implementation**
   Project description: University of Houston worked with *Oak Ridge National Laboratory* to standardize OpenSHMEM via a community-driven specification with a reference implementation. **My Contributions:** I have been particularly involved in the optimization of the collective communication performance.
4. **Coarray Fortran**
   Project description: Coarray Fortran is a set of new language features incorporated into the Fortran 2008 standard to enable parallel programming in Fortran with minimal changes to the

language syntax. It is a joint project between University of Houston and *Total* **My Contributions:** I was particularly involved in the optimization of the Coarray Fortran runtime library with new underlying communication layers.

REFEREED CONFERENCE AND WORKSHOP PUBLICATIONS

My full name is **Naveen Namashivayam Ravichandrasekaran** and I author all conference and workshop publications as **Naveen Namashivayam**.

1. **N.Namashivayam**, S.Mehta, and P.C.Yew. *"Variable-sized Blocks for Locality-aware SpMV"*. In Proceedings of International Symposium on Code Generation and Optimization (CGO 2021). (Accepted).
2. **N.Namashivayam**, B.Long, D.Eachempati, B.Cernohous, and M.Pagel. *"A Modern Fortran Interface in OpenSHMEM."*. In Proceedings of ACM Transactions on Parallel Computing, August, 2020.
3. **N.Namashivayam**, B.Cernohous, D.Pou, and M.Pagel. *"Introducing Cray OpenSHMEMX - A Modular Multi-Communication Layer OpenSHMEM Implementation."*. In Proceedings of Fifth Workshop on OpenSHMEM and Related Technologies, August, 2018, Hanover, USA.
4. **N.Namashivayam**, B.Cernohous, K.Kandalla, D.Pou, J.Robichaux, J.Dinan, and M.Pagel. *"Symmetric Memory Partitions in OpenSHMEM: A case study with Intel KNL"*. In Proceedings of Fourth Workshop on OpenSHMEM and Related Technologies: Big Compute and Big Data Convergence, August, 2017, Annapolis, USA.
5. K.Kandalla, P.Mendygral, N.Radcliffe, B.Cernohous, **N.Namashivayam**, K.McMahon, C.Sadlo and M.Pagel *"Current State of the Cray MPT Software Stacks on the Cray XC Series Supercomputers"*. In proceedings of Cray User Group Meeting, 2017, Redmond, USA.
6. **N.Namashivayam**, D.Knaak, B.Cernohous, N.Radcliffe, and M.Pagel. *"An Evaluation of Thread-Safe and Contexts-Domains Features in Cray SHMEM"*. In Proceedings of Third Workshop on OpenSHMEM and Related Technologies: Enhancing OpenSHMEM for Hybrid Environments, August, 2016, Hanover, USA.
7. **N.Namashivayam**, D.Eachempati, D.Khaldi and B.Chapman. *"OpenSHMEM as a Portable Communication Layer for PGAS Models - A Case Study with Coarray Fortran"*. In Proceedings of IEEE Cluster 2015, September, 2015, Chicago, USA.
8. **N.Namashivayam**, D.Khaldi, D.Eachempati and B.Chapman. *"Extending the Strided Communication Interface in OpenSHMEM"*. In Proceedings of Second OpenSHMEM Workshop: Experiences, Implementations and Tools, August, 2015, Annapolis, USA.
9. D.Knaak, and **N.Namashivayam**. *"Proposing OpenSHMEM Extensions Towards a Future for Hybrid Programming and Heterogeneous Computing"*, In Proceedings of Second OpenSHMEM Workshop: Experiences, Implementations and Tools, August, 2015, Annapolis, USA.
10. **N.Namashivayam**, S.Ghosh, D.Khaldi, D.Eachempati, and B.Chapman. *"Native Mode-Based Optimizations of Remote Memory Accesses in OpenSHMEM for Intel Xeon Phi"*, 8th International Conference on Partitioned Global Address Space Programming Models (PGAS 2014).

THESIS

- N.Namashivayam. *"OpenSHMEM as an Effective Communication Layer for PGAS Models"*. Master's Thesis, University of Houston, October, 2015.