# 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 focus on the following areas: (i) parallel programming models and runtime systems (MPI and Partitioned Global Address Space models like OpenSHMEM, Global Arrays, and Coarray Fortran); (ii) parallel computing architectures (Cray Supercomputers and Clusters, multi-core systems, GPUs and Intel MIC), and (iii) high-speed interconnect libraries(DMAPP)

## 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

## EXPERIENCE

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

- Software Enhancements and Parallel Optimizations for Cray Supercomputer and Cluster environments
- Work specifically on Cray software stacks like Cray MPI, Cray SHMEM, and Global Arrays
- HPC and parallel programming runtime optimizations for Cray hardware to be utilized by specific customers like U.S government and commercial petroleum industries
- Participate and represent 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*

- Design parallel test framework to validate bank statements for a leading financial services company

## TECHNICAL STRENGTHS

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|---|---|
| **Computer Languages** | C/C++, Fortran, Java, Python, Ruby, Scala |
| **Parallel Programming Models** | OpenSHMEM, OpenMP, MPI, Coarray Fortran |
| **Network Libraries** | DMAPP, Verbs, Libfabrics |
| **Architectures** | Cray Supercomputers, & Clusters, Intel MIC |

## PROJECTS

### Current Projects

1. **Cray SHMEM**
   - optimize and maintain Cray SHMEM for different platforms
   - implement new features as per the OpenSHMEM standards
   - propose and prototype new features like Communication Contexts, Symmetric Memory Partitions and Teams(PE-Subsets)
2. **Cray MPICH**
   - create an optimized message matching layer for the MPI implementation.
3. **Cray Global Arrays(Cray-GA)**
   - optimize and maintain the ComEx - DMAPP communication layer

### Past Projects

1. **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.
2. **Coarray Fortran**
   **Project description:** Coarray Fortran is a set of new language features incorporated into the Fortran 2008 standard which 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 am particularly involved in the optimization of the Coarray Fortran runtime library with new underlying communication layers.

## REFEREED CONFERENCE AND WORKSHOP PUBLICATIONS

1. 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, Maryland, USA.
   *To Appear*
2. 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, Washington, USA.
   *To Appear*
3. 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, Maryland, USA.
   `https://link.springer.com/chapter/10.1007/978-3-319-50995-2_11`
4. N.Namashivayam. *"OpenSHMEM as an Effective Communication Layer for PGAS Models"*. Master's Thesis, University of Houston, October, 2015.
   `https://pdfs.semanticscholar.org/1c6b/9787b0eda7723a14ba6bc92cd77a7dcb0102.pdf`

5. 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.
`https://www.computer.org/csdl/proceedings/cluster/2015/6598/00/6598a438.pdf`

6. 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, Maryland, USA.
`https://link.springer.com/chapter/10.1007/978-3-319-26428-8_1`

7. 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, Maryland, USA.
`https://dl.acm.org/citation.cfm?id=2952638`

8. 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).
`https://dl.acm.org/citation.cfm?id=2676881`

## KEY ACTIVITIES

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

## 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 Engineering College, Anna University, India, 2011.