NAVEEN N RAVI

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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 design and optimizations in the following areas: (i) distributed parallel programming models and runtime systems for HPC (MPI and OpenSHMEM) and ML (NCCL/RCCL); (ii) parallel computing architectures, and (iii) high-speed network interconnects (HPE Slingshot and Nvidia Infiniband).

EXPERIENCE

Hewlett Packard Enterprise (previously Cray, Inc) Jan,2016 - present
Senior Systems/Software Engineer *Bloomington, MN*

· HPC and ML communication runtime optimizations for HPE/Cray supercomputers and clusters
· Tech Lead for Cray programming environment software stacks including Cray MPI and Cray SHMEM
· Participate and represent HPE/Cray in OpenSHMEM and MPI standards committee

Cray, Inc May,2015 - Dec,2015
Intern *Saint Paul, MN*

· Research and prototype new communication protocols in Cray SHMEM library
· Optimize Global Arrays library for NAMD and NWChem Chemistry applications

University of Houston Sep,2013 - May,2015
Research Assistant - HPC Tools *Houston, TX*

· Research Assistant to Prof. Barbara Chapman
· Explore strategies for communication runtime optimizations for scalable parallel systems

EDUCATION

University of Minnesota, Twin Cities *Aug,2022 - Present*
Ph.D. in Computer Science

University of Houston, Main Campus *Aug,2013 - Dec,2015*
M.S. in Computer Science - Specialization in Parallel & Distributed Systems

Anna University, India *Sep,2007 - May,2011*
Bachelors in Engineering - Electrical & Electronics Engineering

TECHNICAL STRENGTHS

Programming Languages	C/C++, Python
Parallel Programming Models & Libraries	OpenSHMEM, MPI, NCCL/RCCL
Network Libraries	Libfabric, UCX, Verbs
Architectures	HPE Cray Supercomputers & Clusters
System Architectures	Aarch64 (Nvidia Grace), x86_64 (AMD Milan)
Network Architectures	HPE Slingshot, Cray Aries, Nvidia Infiniband
Device Architectures	AMD (MI250X, MI300A), Nvidia (A100, H100)

STANDARDIZATION ACTIVITIES

1. **OpenSHMEM standardization Effort**, Participate and represent HPE in OpenSHMEM standards committee. `http://openshmem.org/`.
2. **MPI Forum**, Participate and represent HPE in the standardization forum for the Message Passing Interface (MPI). `https://www.mpi-forum.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 Eng. College, Anna University, India, 2011.

FUNDED PROJECTS

1. Intra-node MPI Support for Intel GPUs. *Contract in relation to the Collaboration of Intel and HPE (Cray) for Argonne Aurora Supercomputer*, 2021.
2. Multi-NIC and Multi-GPU Network Support for MPI. *Collaboration of Oak Ridge, Argonne, and Livermore (CORAL-2) Contract*, 2022.
3. GPU Triggered Communication for MPI Point-to-Point Communication. *Collaboration of Oak Ridge, Argonne, and Livermore (CORAL-2) Contract*, 2022.
4. GPU Triggered Communication for MPI One-sided Communication. *Collaboration of Oak Ridge, Argonne, and Livermore (CORAL-2) Contract*, 2023.
5. OpenSHMEM Append communication scheme for sorting. *Numerically Challenged, a pathfinding project for next-gen HPE Slingshot NIC*, 2024.

PUBLICATIONS

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

Refereed Conference and Workshop Publications

1. T.Groves, **N.Namashivayam**, B.Cook, B.Friesen, N.Keen, D.Trebotich, N.J.Wright, B.Alverson, D.Roweth, and K.Underwood. *"Not All Applications Have Boring Communication Patterns: Profiling Message Matching with BMM"*. In Proceedings of Concurrency and Computation: Practice and Experience.
2. **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).
3. **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.
4. **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.

5. **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.

6. 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.

7. **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.

8. **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.

9. **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.

10. 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.

11. **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.

Other Publications

1. **N.Namashivayam**, K. Kandalla, T. White, L.Kaplan, and M. Pagel. *"Exploring Fully Offloaded GPU Stream-Aware Message Passing"*. arXiv preprint arXiv:2306.15773.

2. **N.Namashivayam**, K. Kandalla, T. White, N. Radcliffle, L.Kaplan, and M. Pagel. *"Exploring GPU Stream-Aware Message Passing using Triggered Operations"*. arXiv preprint arXiv:2306.15773.

PEER REVIEW PROFESSIONAL ACTIVITIES

1. Workshop on OpenSHMEM and Related Technologies 2016, 2017, 2018, and 2021.

2. IEEE *Transactions on Parallel and Distributed Systems* (TPDS).

PATENTS

1. Offloading network communication operation synchronizations to accelerator streams, 2022.

2. Efficient inter-process broadcast in a distributed system, 2023.

3. Adaptive triggered operation management in a network interface controller, 2023.