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OBJECTIVE

To obtain a challenging full-time research position in systems software. My interests lie in improving Performance and Resource scalability of Communication Protocols and Algorithms over modern Interconnects and Multi-core processors.

EDUCATION

The Ohio State University , Columbus, Ohio PhD, Computer Science and Engineering	Winter 2008 (Expected)
Indian Institute of Technology , Chennai, India BTech, Computer Science and Engineering	May 2002

EXPERIENCE

Argonne National Laboratory , Argonne, IL Summer Intern, Mathematics and Computer Science Division	June 2006 – September 2006
The Ohio State University , Columbus, OH Graduate Research Assistant	June 2003 – Present
The Ohio State University , Columbus, OH Graduate Teaching Assistant Instructor for C++	September 2002 – May 2003

PUBLICATIONS

- Jiuxing Liu, **Amith R Mamidala** and Dhabaleswar K Panda. Performance Evaluation of InfiniBand with PCI-Express, IEEE Micro Journal, 2005
- Rahul Kumar, **Amith R Mamidala** and Dhabaleswar K Panda. Scaling Alltoall Collective on Multicore Systems, Workshop on Communication Architecture for Clusters, IPDPS 2008
- **Amith R Mamidala**, Rahul Kumar, Debraj De and Dhabaleswar K Panda. MPI Collectives on Modern Multicore Clusters: Performance Optimizations and Communication Characteristics, Int'l Symposium on the Cluster Computing and the Grid (CCGrid), May 2008
- **Amith R Mamidala**, Sundeep Narravula, Abhinav Vishnu, Gopal K Santhanaraman and Dhabaleswar K Panda. Using Connection-Oriented and Connection-Less transport on Performance and Scalability of Collective and One-sided operations: Trade-offs and Impact, Accepted at ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, PPOPP 07
- Gopal K Santhanaraman, Sundeep Narravula, **Amith R Mamidala**, and Dhabaleswar K Panda, MPI-2 One Sided Usage and Implementation for Read Modify Write operations: A case study with HPCC, In Proceedings of EuroPVM/MPI '07, Paris, France
- Sundeep Narravula, **Amith R Mamidala**, Abhinav Vishnu, Karthik Vaidyanathan and Dhabaleswar K Panda. High Performance Distributed Lock Management Services using Network-based Remote Atomic Operations, Int'l Symposium on Cluster Computing and the Grid (CCGrid), Rio de Janeiro - Brazil, May 2007
- Sundeep Narravula, **Amith R Mamidala**, Abhinav Vishnu and Dhabaleswar K Panda. High Performance MPI over iWARP: Early Experiences, International Conference for Parallel Processing, ICPP 2007
- Abhinav Vishnu, Matt Koop, Adam Moody, **Amith R Mamidala**, Sundeep Narravula and Dhabaleswar K Panda. Hot-Spot Avoidance With Multi-Pathing Over InfiniBand: An MPI Perspective, Int'l Symposium on Cluster Computing and the Grid (CCGrid), Rio de Janeiro - Brazil, May 2007

- Abhinav Vishnu, **Amith R Mamidala**, Sundeep Narravula and Dhabaleswar K Panda. Automatic Path Migration over InfiniBand: Early Experiences, Third International Workshop on System Management Techniques, Processes, and Services, to be held in conjunction with IPDPS '07, March 2007
- Abhinav Vishnu, Prachi Gupta, **Amith R Mamidala**, and Dhabaleswar K Panda. A Software Based Approach for Providing Network Fault Tolerance in Clusters with uDAPL interface: MPI Level Design and Performance Evaluation, Supercomputing, SC 06
- **Amith R Mamidala**, Abhinav Vishnu and Dhabaleswar K Panda. Efficient Shared Memory and RDMA based design for MPI_Allgather over InfiniBand, EuroPVM/MPI Conference, 2006
- **Amith R Mamidala**, Lei Chai, Hyun-Wook Jin and Dhabaleswar K Panda. Efficient SMP-Aware MPI-Level Broadcast over InfiniBand's Hardware Multicast, Workshop on Communication Architecture for Clusters, IPDPS 2006
- Jiuxing Liu, **Amith R Mamidala** and Dhabaleswar K Panda. Performance Evaluation of InfiniBand with PCI-Express, IEEE Micro, 2005
- **Amith R Mamidala**, Hyun-Wook Jin and Dhabaleswar K Panda. Efficient Hardware Multicast Group Management for Multiple MPI Communicators over InfiniBand, EuroPVM/MPI Conference 2005
- Sayantan Sur, Uday Bondhugula, **Amith R Mamidala**, Hyun-Wook Jin and Dhabaleswar K Panda. High Performance RDMA Based All-to-all Broadcast for InfiniBand Clusters, International Conference on High Performance Computing, HiPC 2005
- Abhinav Vishnu, **Amith R Mamidala**, Hyun-Wook Jin and Dhabaleswar K Panda. Performance Modeling of Subnet Management on Fat Tree InfiniBand Networks using OpenSM, Workshop on System Management Tools for Large-Scale Parallel Systems, IPDPS 2005
- **Amith R Mamidala**, Jiuxing Liu and Dhabaleswar K Panda. Efficient Barrier and Allreduce on InfiniBand clusters using Hardware Multicast and Adaptive algorithms, International Conference on Cluster Computing, Cluster 2004
- Jiuxing Liu, **Amith R Mamidala** and Dhabaleswar K Panda. Fast and Scalable MPI-Level Broadcast using InfiniBand's Hardware Multicast Support in proceedings of International Parallel and Distributed Processing Symposium, IPDPS 2004
- Jiuxing Liu, **Amith R Mamidala** and Dhabaleswar K Panda. Performance Evaluation of InfiniBand with PCI-Express, Hot Interconnects: Symposium on high performance interconnects, HOTI 2004
- Jiesheng Wu, **Amith R Mamidala** and Dhabaleswar K Panda. Can NIC memory in InfiniBand Benefit Communication Performance? – A Study with Mellanox Adapter, Technical report, OSU-CISRC-4/04-TR20

PROJECTS

MVAPICH Software:

- Most widely used Message Passing Communication Software for InfiniBand interconnection network. Used by 3rd ranked supercomputer in TOP 500 list (November 07 ranking)
- Designed and Integrated different software modules for Efficient and Scalable means of group communication

Communication Protocols:

- Understanding message communication within a Cluster of commodity processors interconnected by InfiniBand Network. The salient issues being the trade-offs in performance and memory usage for two modes of transport: Reliable Connection and Unreliable Datagram
- Design of Communication substrate for messaging over IWARP (latest RDMA-enabled Ethernet standard)
- Design of Scalable and Reliable means of Group Communication (e.g. Multicast) between thousands of processors connected over InfiniBand network

Communication Algorithms:

- Design of Efficient algorithms for inter-process communication for an imperfectly load balanced application
- Exploiting the semantic advantages of RDMA for Group Communication compared to traditional Send/Recv approaches
- Using Analytical models to study and capture the behavior of different communication algorithms for Multi-core clusters

Data-center Project:

- Providing for Distributed Shared Locking support for Data-centers over InfiniBand

Shared Memory for Multi-cores:

- Design of efficient inter-process communication system within Multi-core processors (e.g. Intel Clovertown) and optimizations for group communication
- Using integrated RDMA and Shared Memory mechanism for All-to-all Broadcast of data over InfiniBand
- Ongoing work: Cache-conscious message communication for Multi-cores

Multi-Pathing:

- Exploring automatic path migration mechanism in InfiniBand for providing network-level Fault Tolerance
- Designing Congestion Avoidance techniques over InfiniBand

Performance Benchmarking:

- Construction of a set of micro-benchmarks such as Latency and Bandwidth to evaluate the performance of InfiniBand with PCI-Express I/O interfaces
- Comprehensive evaluation of advantages of using memory in the network card for inter-process communication

SKILLS

Programming Languages: C, C++, Visual C++, Lisp, Shell scripts and MPI-level programming

Profiling Tools: mpiP, PAPI, fpmi

Operating Systems: Linux, Windows (98/NT), DOS and Solaris

Other: User Level Protocols for High-Speed networks (InfiniBand, IWARP), CORBA, Java RMI and 80x86 Assembly

AWARDS and HONORS

- Merit certificate for top 50 students entering IIT-Madras
- Placed in top 50 in IIT-JEE Engineering Entrance Examination taken by over 1,00,000 students
- Gold Medalist for topping the class in the Indian School Certificate Examination

PROFESSIONAL ACTIVITIES

- External reviewer for IEEE TPDS, TKDE journals
- External reviewer for IPDPS, SC, ICPP, ICS conferences

REFERENCES

- Available on Request