Pritish Jetley
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RESEARCH INTERESTS

Parallel languages: abstractions and run-time support
Large scale parallel simulations for scientific discovery
High performance communication paradigms

EDUCATION

Doctoral Candidate in Computer Science, University of Illinois at Urbana-Champaign
Anticipated dissertation defence: May 2013
Thesis topic: *Incompleteness+Interoperability: A Multi-Paradigm Approach to Parallel Programming*
Advisor: Prof. Laxmikant V. Kale

BTech, Computer Science and Engineering, Indian Institute of Technology Guwahati
CGPA 9.27/10.0
Thesis Topic: Decidability and Applications of Generalized Timed Automata in Real Time Scheduling
Advisor: Prof. Purandar Bhaduri

RESEARCH EXPERIENCE

Research fellowship, Bhalla lab   August 2012 – Feb 2013
National Center for Biological Sciences, TIFR, India.
Development of a portable and scalable parallel runtime substrate for the multiscale object-oriented simulation environment (MOOSE). Experiments on scalability of large-scale spiking neural networks, and biophysically detailed electrochemical simulations of neuronal networks.

Research Assistantship, Parallel Programming Lab   August 2006 – present
University of Illinois at Urbana-Champaign
Models for productive, performance-oriented parallel programming. High performance computational cosmology on multicore and GPGPU clusters. Dynamic load balancing and zero-copy communication.

Summer Internship, Morgan Stanley   June – August 2008
Researched Monte Carlo methods on heterogeneous systems. Rigorous testing of proprietary trading strategies. Developed basket trading account management tool suite.

Senior Year Research Project, IIT Guwahati   August 2005 – July 2006
Extended Theory of Timed Automata with Tasks to precedence order constrained multiprocessor systems. Demonstrated decidability of such systems.

Summer Internship, IT Center Dortmund GmbH   May – July 2005
Developed a scalable automata-centric infrastructure for Internet data retrieval.

PUBLICATIONS

Incorporating Dynamic Communication Patterns in a Static Dataflow Notation , **Pritish Jetley**, Adarsh Keshan and Laxmikant V. Kale, Proc. Workshop on Data Flow Execution Models for Extreme Scale Computing, Sept. 2012.

(Best Paper Award) *Optimizations for Message Driven Applications on Multicore Architectures*, **Pritish Jetley** and Laxmikant V. Kale, Proc. IEEE Intl. Conf. High Performance Computing (HiPC) 2011.

ParSSSE: An Adaptive Parallel State Space Search Engine, Yanhua Sun, Gengbin Zheng, **Pritish Jetley** and Laxmikant V. Kale, Parallel Processing Letters, 21(3), pp. 319-338, 2011.

Parallel Combinatorial Search, Laxmikant V. Kale and **Pritish Jetley**, Encyclopedia of Parallel Computing, David Padua, ed., Springer Verlag, 2011.

An Adaptive Framework for Large-scale State Space Search, Yanhua Sun, Gengbin Zheng, **Pritish Jetley** and Laxmikant V. Kale, Proc. Workshop on Large Scale Parallel Processing at IPDPS 2011.

Architectural constraints to attain 1 Exaflop/s on three scientific application classes, Abhinav Bhatele, **Pritish Jetley**, Hormozd Gahvari, Lukasz Wesolowski, William D. Gropp and Laxmikant V. Kale, Proc. IEEE International Parallel and Distributed Processing Symposium 2011.

Scaling Hierarchical N-Body Simulations on GPU Clusters, **Pritish Jetley**, Lukasz Wesolowski, Filippo Gioachin, L. V. Kale and Thomas R. Quinn, Proc. ACM/IEEE Supercomputing Conference 2010 (SC10).

Static Macro Data Flow: Compiling Global Control into Local Control, **Pritish Jetley** and L. V. Kale, Proc. 15th Intl. Workshop on High-Level Parallel Programming Models and Supportive Environments, at IPDPS 2010.

CkDirect: Unsynchronized One-Sided Communication in a Message-Driven Paradigm, Eric Bohm, Sayantan Chakravorty, **Pritish Jetley**, Abhinav Bhatele and L. V. Kale, Proc. Second Intl. Workshop on Parallel Programming Models and Systems Software for High-End Computing.

Massively Parallel Cosmological Simulations with ChaNGa, **Pritish Jetley**, Filippo Gioachin, Celso L. Mendes, L. V. Kale and Thomas R. Quinn, Proc. 22nd IEEE Intl. Parallel and Distributed Processing Symposium, April 2008.

Manuscripts in preparation *(Available upon request)*

Charisma: A Language for Static Macro Data Flow, Pritish Jetley, Chao Huang and L. V. Kale
A scalable distributed tree abstraction, Pritish Jetley and L. V. Kale
Large Scale, Distributed Memory Divide-and-Conquer, Pritish Jetley, Aaron Becker and L. V. Kale

TEACHING EXPERIENCE

Course instructor, Computer Architecture I   Summer Semester, 2010

Taught introductory course on computer architecture, CS 231. Covered topics from Boolean algebra and gate design to combinatorial and sequential circuits, memory and the modular design of microprocessors. The class comprised about 20 undergraduate-level students and featured the use of electronic instructional tools to encourage class participation.

INVITED TALKS

Case Studies in Asynchronous, Message-Driven Shared-Memory Programming, research seminar of the Universal Parallel Computing Research Center at the University of Illinois.

Techniques for High Performance Computational Cosmology, Supercomputing Center of the Computer Network Information Center (CNIC) at the Chinese Academy of Sciences.

HONORS and ACTIVITIES

- Indo-US Science & Technology Forum RISE Award 2012
- Department of Computer Science Feng Chen Memorial Award 2012
- Best paper award at 2011 IEEE Conference on High Performance Computing (HiPC 2011)
- Best performance award, Class II HPC Challenge at Supercomputing 2011
- IIT Guwahati Department of Computer Science Merit Scholarship, 2005 and 2006
- Invitee at the 2006 TCS Excellence in Computer Science summer school
- German Academic Exchange Service (DAAD) 2005 summer internship program

REFEREES

Prof. Laxmikant V. Kale   Prof. Upinder S. Bhalla   Prof. Thomas R. Quinn
Dept. of Computer Science   Natl. Center for Biological Sciences   Department of Astronomy
Univ. Illinois   Bangalore, India   University of Washington
Urbana-Champaign   *bhalla@ncbs.res.in*   *trq@astro.washington.edu*
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