

Vasudevan Rengasamy

PERSONAL DATA

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ABOUT ME

I am a PhD student at The Pennsylvania State University. My current research is in the area of High Performance Computing focusing on parallel algorithm development for genomic workflows. I'm actively seeking full time employment opportunities.

EDUCATION

AUG 2014-Present	PhD in COMPUTER SCIENCE AND ENGINEERING Pennsylvania State University, USA Advisors: Dr. Kamesh Madduri, Prof. Mahmut Kandemir Key Courses: Algorithms, Compiler Construction, Multiprocessor Architecture, Manycore Programming Research work: Optimizing Word2Vec: Word2Vec is a widely used word embedding technique which learns low dimensional vector representation for words in a training corpus. My work improved the floating point throughput by processing multiple contexts together thus obtaining 1.3$\times$ speedup over prior implementation. Source code: https://github.com/vasupsu/IA3_Paper16_ArtifactEvaluation Efficient Preprocessing for Metagenome Assembly: Metagenome samples consist of genome sequences of many different species. Metagenome assembly process can be parallelized by assembling individual deBruijn graph components concurrently. I have developed a workflow called MetaPrep for performing parallel and memory-efficient identification of connected components from read graphs constructed from metagenome sequences. Source code: https://github.com/vasupsu/MetaPrep Accelerating Genetic Variant Detection: Genetic variant detection pipeline is compute and I/O intensive and takes few days to complete if executed serially. I have developed a tool SPRITE to optimize different stages of the pipeline by exploiting <i>intra-node and inter-node parallelism and avoiding intermediate I/O</i> by in-memory data processing. SPRITE has a novel counting based variant calling algorithm called PARSNIP which is very fast and has good accuracy for sequencing data with high coverage. Source code: sprite-psu.sourceforge.net GPA: 3.68/4
AUG 2011-JUN 2014	MSc(Engineering) in COMPUTER SYSTEMS Indian Institute of Science, India Advisor: Dr. Sathish Vadhiyar Key Courses: Algorithms, Operating Systems Research work: "A Message Driven Adaptive Framework for Regular and Irregular Applications on GPUs" Developed a framework G-CHARM to improve the performance of CHARM++ applications by effectively utilizing heterogeneous GPU and CPU cores. The project aims to overcome the challenges such as communication latency between CPU and GPU, resource idling etc. with minimum programmer overhead. GPA: 6/8
AUG 2004-MAY 2008	B.Tech in COMPUTER SCIENCE AND ENGINEERING SASTRA University, India GPA: 9.62/10

AREAS OF INTEREST

High Performance Computing, Computational Biology, Operating Systems

WORK EXPERIENCE

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| MAY 2016-AUG 2016 | Research Associate at HP Labs, Princeton, NJ.
Worked towards identifying potential security related events in an enterprise network from anomalous user/system behavior. In the first part of this work, I created time-series models to model each user's normal behavior and then identified time slots corresponding to anomalous behavior. In the second part, I worked towards determining if there is a correlation between the detected anomalies and security incidents. |
| OCT 2008-JUNE 2011 | Systems Engineer at TATA Consultancy Services Limited, India
Worked in mainframe applications development, managing a portion of the deposits system of a bank. The work involved source code analysis, monitoring daily batch runs and making enhancements to the existing systems as requested by business partners. |
| AUG 2007-JAN 2008 | Intern at KLINIK KLOSTER PARADIESE, Soest, Germany
Indexed nearly 2000 articles and magazines related to cancer research and developed a web interface and back-end to query the indexed data. |

OTHER PROJECTS

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| Pintos | Modified Pintos kernel as part of Operating Systems course project. This involved implementing priority and MLFQ schedulers, adding system call interface for user programs, virtual memory management including frame allocation, clock page eviction algorithm, lazy page loading and file system management. |
| MORCO | Contributed to the development of MORCO framework which is a middleware for executing long-running multi-component applications with execution times much greater than execution time limits of batch queues. |

SCHOLARSHIPS AND AWARDS

Best Outgoing Student Award for the 2008 batch of B.Tech - Computer Science of SASTRA University.
Merit scholarships for being among top 2% students in terms of academic performance in the years 2004, 2005.

PUBLICATIONS

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| Nov 2017 | Vasudevan Rengasamy, Tao-Yang Fu, Wang-Chien Lee, Kamesh Madduri, Optimizing Word2Vec Performance on Multicore Systems , <i>IA³</i> workshop 2017 (Best Artifact Award) |
| June 2017 | Vasudevan Rengasamy, Paul Medvedev, Kamesh Madduri, Parallel and Memory-Efficient Preprocessing for Metagenome Assembly , HiCOMB 2017 |
| June 2016 | Vasudevan Rengasamy, Kamesh Madduri, SPRITE: A fast parallel SNP detection pipeline . In Proceedings. ISC High Performance, 2016 |
| Oct 2015 | K. Madduri, V. Rengasamy, and P. Medvedev, SPRITE: A fast parallel SNP detection pipeline poster presentation at the American Society of Human Genetics (ASHG) Annual Meeting, Oct. 2015 |
| June 2013 | R. Vasudevan, Sathish S. Vadhiyar, and Laxmikant V. Kalé. G-Charm: an adaptive runtime system for message-driven parallel applications on hybrid systems . In Proceedings of the 27th international ACM conference on International conference on supercomputing (ICS '13) |

PROGRAMMING SKILLS

C, C++, JAVA, MPI, openMP, CUDA, CHARM++, R, PYTHON