

Vishwesh Jatala

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Research Interests

Computer Architecture (GPU and CPU), Optimizing Compilers for GPU Performance and Energy, High Performance Computing, Source to Source Translators, Parallelization.

Education

Doctor of Philosophy

July 2011 - Present

Department of Computer Science & Engineering

Indian Institute of Technology, Kanpur

CPI: 9.0/10

Thesis Advisor: Prof. Amey Karkare

Bachelor of Technology

July 2005 - May 2009

Department of Computer Science & Engineering

Visvesvaraya National Institute of Technology, Nagpur

CPI: 9.23/10 (**Institute Medal**)

Academic Achievements

- Recipient of **Tata Consultancy Services (TCS) Fellowship** since 2014.
- Awarded **Institute Medal** for academic excellence in B.Tech, CSE, 2005-09.
- Awarded **Academic Excellence Prize** for academic excellence in B.Tech, CSE, 2005-09.
- Awarded **Dr.V.M. Dokras Felicitation Committee Prize** for academic excellence in 3rd year B.Tech, CSE, 2007-08.
- Awarded **Academic Excellence Prize** for academic excellence in 3rd year B.Tech, CSE, 2007-08.
- Awarded **Dr.S.G.Ghangrekhar Prize** for excellence in Mathematics in B.Tech, 2005-06.

Experience

• IBM India Research Laboratory

May 2013 - July 2013

Research Intern

New Delhi

Project Title: Reliable Multicast using Software Defined Networking

In this project, we provided reliability service for group communication. The project extends Avalanche multi-cast routing algorithm by supporting reliability using pragmatic general multicast (PGM) protocol.

• IIT Kanpur

Aug 2011 - July 2012

System Administrator

Kanpur

The project duties involve in resolving departmental network and computer laboratory issues.

• Oracle India Pvt Ltd

June 2009 - July 2011

Member of Technical Staff

Hyderabad

The aim of our project is to find the security vulnerabilities in a product and provide best possible solutions to make it secure.

Publications

- *Vishwesh Jatala*, Jayvant Anantpur, and Amey Karkare, GREENER: A Tool for Improving Energy Efficiency of GPU Register File, in High Performance Computing, Data, and Analytics, Student Research Symposium (**HiPC, SRS**), Jaipur, India, 2017 [**Best Poster Award**].
- *Vishwesh Jatala*, Jayvant Anantpur, and Amey Karkare, Scratchpad Sharing in GPUs, in ACM Transactions on Architecture and Code Optimization (**TACO**), 2017.
- *Vishwesh Jatala*, Jayvant Anantpur, and Amey Karkare, Improving GPU Performance Through Resource Sharing, 25th Symposium on High-Performance Parallel and Distributed Computing (**HPDC**), Kyoto, Japan, 2016.
- *Vishwesh Jatala*, Jayvant Anantpur, and Amey Karkare, Resource Sharing for GPUs, Code Generation and Optimization (**CGO**, Poster Track), Barcelona, Spain, 2016.
- *Vishwesh Jatala*, Jayvant Anantpur, and Amey Karkare, GREENER: A Tool for Improving Energy Efficiency of Register Files, CoRR, <https://arxiv.org/abs/1709.04697>, 2017.

Talks/Presentations

- *Scratchpad Sharing in GPUs*, at 12th Inter-Research-Institute Student Seminar in Computer Science (IRISS), Nagpur, Feb 2018.
- *Scratchpad Sharing in GPUs*, CSE Doctoral Symposium, NIIT University, Rajasthan, September 23rd-24th, 2017.
- Poster Presentation on *Resource Sharing for GPUs*, IBM Research Day, IIT Kanpur, April 2017. [**IBM Best Poster Award**]
- *Improving GPU Performance Through Resource Sharing*, 11th Inter-Research-Institute Student Seminar in Computer Science (**IRISS**), Kolkata, Jan 2017.
- Poster Presentation on *Resource Sharing for GPUs*, Technology Day, IIT Kanpur, May 016.

Technical Skills

Open Source Simulators/Tools	GPGPU-Sim, GPU Ocelot, Cetus, GPUWattch CACTI, McPAT, Soot, Lex, Yacc, PIN
Programming Languages	C, C++, Java, and Pascal
Assembly Level Languages	PTX and MIPS
Scripting Languages	Perl Script and Shell Script
Parallel Programming	CUDA, OpenMP, and MPI
Network Programming	RPC, RMI, and Sockets
Query Languages	SQL, LINQ, and SPARQL

Teaching Assistant

CS738: Advanced Compiler Optimizations	CS335: Compiler Design
CS601: Mathematics for Computer Science	CS220: Introduction to Computer Organization
CS252: Computing Laboratory	CS639: Program Analysis, Verification and Testing
NPTEL: Fundamentals of Database System	CS602: Design and Analysis of Algorithms
Workshop on C Programming & Data Structures	

Academic Course Projects

- **B.Tech Project: Automatic Number Plate Detection System using HTM**

In this project, we implemented a number plate recognition system which can extract registration number from the image of a vehicle that is located at a suitable distance from a camera. We used image processing techniques to extract the number plate from the image, and recognized the characters in the number plate using hierarchical temporal memory (HTM).

- **CS622: Cache Replacement Policy using Future and Reuse Distance**

LRU cache replacement policy fails to minimize cache misses when applications do not support temporal locality. To minimize the cache misses, we propose an approach that emulates the optimal replacement policy by introducing future and reuse distance in the cache.

- **CS738: Implementing Higher Level Loop Optimizations**

We implemented the following loop optimizations for parallelizing loops in a program: loop interchange, loop skewing, loop reversal, and loop selection.

- **CS618: Semantic Searching Technique in Temporal Database**

Semantic searching techniques yield better results than the syntactic searching techniques. In this project, we implemented a technique to semantically search for given text from a temporal database. The proposed implementation uses RDF graph to represent the temporal information and uses R* tree to index the given the data.

References

- Prof.Amey Karkare, Associate Professor, Department of CSE, IIT Kanpur, Kanpur, India.
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- Prof.Mainak Chaudhuri, Associate Professor, Department of CSE, IIT Kanpur, Kanpur, India.
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- Jayvant Anantpur, Principal Engineer, Mentor Graphics India Pvt Ltd.
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