Vishwesh Jatala

Assistant Professor
Office: 401A, Department of CSE, IIT Bhilai
Permanent Campus, Kutelabhata Bhilai, Durg - 491001, Chhattisgarh, India
Email: vishwesh@iitbhilai.ac.in Homepage: https://vishweshjatala.github.io/

Research Interests

Graphics Processing Units (GPUs), High-Performance Computing, Graph Neural Networks, Graph Analytics.

Education

Doctor of Philosophy *July 2011 - Dec 2018*
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**)

Professional Experience

- Assistant Professor, **IIT Bhilai** *Aug 2020 - Present*
- Postdoctoral Fellow, **University of Texas at Austin** *Jan 2019 - June 2020*
- Research Fellow, **University of Texas at Austin** *May 2018 - Dec 2018*
- Research Intern, **IBM India Research Laboratory** *May 2013 - July 2013*
- Member of Technical Staff, **Oracle India Pvt Ltd** *June 2009 - July 2011*

Publications

1. Distributed Graph Neural Networks, Dhruv Deshmukh, Gagan Gupta, and **Vishwesh Jatala**, Tutorial Track, Joint International Conference on Data Sciences and Management of Data **(CODS-COMAD)**, 2024
2. Dhruv Deshmukh, Gagan Gupta, Manisha Chawla, **Vishwesh Jatala**, and Anirban Haldar, Entropy Aware Training for Fast and Accurate Distributed GNN, 23rd IEEE International Conference on Data Mining **(ICDM)**, 2023
3. Memory Efficient Sparse Matrix-Matrix Multiplication on GPU, Apurva Dogra, Kishan Tamboli, and **Vishwesh Jatala** at Student Research Symposium, 30th IEEE International Conference on High Performance Computing, Data, and Analytics **(HiPC)**, 2023.
4. Manohar Lal Das, **Vishwesh Jatala**, and Gagan Raj Gupta, Joint Partitioning and Sampling Algorithm for Scaling Graph Neural Networks, 29th IEEE International Conference on High Performance Computing, Data, and Analytics **(HiPC)**, 2022.
5. David P. Bunde, Kishwar Ahmed, Sridevi Ayloo, Tisha Brown-Gaines, Joel Fuentes, **Vishwesh Jatala**, Ruth Kurniawati, Işl $\ddot{O}$z, Apan Qasem, Philip J. Schielke, Mary C. Tedeschi, Thomas Y. Yeh, Adopting Heterogeneous Computing Modules: Experiences from a ToUCH Summer Workshop,10th Workshop on Education for High-Performance Computing **(EduHPC-22)**, 2022.

6. Niharika Nayak, **Vishwesh Jatala**, Accelerating Graph Neural Networks using GPU, at Student Research Symposium **(SRS)**, 29th IEEE International Conference on High Performance Computing, Data, and Analytics **(HiPC)**, 2022.
7. Hochan Lee, David Wongy, Loc Hoang, Roshan Dathathri, Gurbinder Gill, **Vishwesh Jatala**, David Kucky, and Keshav Pingali, A Study of APIs for Graph Analytics Workloads, in IEEE International Symposium on Workload Characterization & Distributed Processing Symposium **(IISWC)**, 2020.
8. **Vishwesh Jatala**, Roshan Dathathri, Gurbinder Gill, Loc Hoang, V Krishna Nandivada, Keshav Pingali, A Study of Graph Analytics for Massive Datasets on Large-Scale Distributed GPUs, in 34th IEEE International Parallel & Distributed Processing Symposium (**IPDPS**), 2020.
9. Roshan Dathathri, Gurbinder Gill, Loc Hoang, Hoang-Vu Dang, **Vishwesh Jatala**, V Krishna Nandivada, Marc Snir, Keshav Pingali, Gluon-Async: A Bulk-Asynchronous System for Distributed and Heterogeneous Graph Analytics, in ACM/IEEE International Conference on Parallel Architectures and Compilation Techniques (**PACT**), 2019 [**Nominated for Best Paper**].
10. Loc Hoang*, **Vishwesh Jatala***, Xuhao Chen, Udit Agarwal, Roshan Dathathri, Gurbinder Gill, Keshav Pingali, DistTC: High Performance Distributed Triangle Counting, in IEEE High Performance extreme Computing Conference (**HPEC**), 2019. [* Both authors contributed equally] [**Student Innovation Award**].
11. **Vishwesh Jatala**, Jayvant Anantpur, and Amey Karkare, Reducing GPU Register File Energy, in 24th International European Conference on Parallel and Distributed Computing (**Euro-Par**), 2018.
12. **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**].
13. **Vishwesh Jatala**, Jayvant Anantpur, and Amey Karkare, Scratchpad Sharing in GPUs, in ACM Transactions on Architecture and Code Optimization (**TACO**), 2017.
14. **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.
15. **Vishwesh Jatala**, Jayvant Anantpur, and Amey Karkare, Resource Sharing for GPUs, Code Generation and Optimization (**CGO**, Poster Track), Barcelona, Spain, 2016.

Technical Reports

- **Vishwesh Jatala**, Loc Hoang, Roshan Dathathri, Gurbinder Gill, V Krishna Nandivada, Keshav Pingali, An Adaptive Load Balancer For Graph Analytical Applications on GPUs, Arxiv, 2019.

Sponsored Research Projects

- **Vishwesh Jatala**, A High-Performance and Memory Efficient Graph Analytical Framework for GPUs. Project Fund: ∼30 Lacs. Funding Agency: DST/SERB. 2021-23.
- **Vishwesh Jatala**, A High-Performance and Memory-Efficient Deep Learning Framework for GPUs. Project Fund: ∼12 Lacs. Research Initiation Grant. IIT Bhiai. 2022-25.
- Gagan Raj Gupta, **Vishwesh Jatala (Co-PI)** Digital Transformation System For Pre-Failure Alert Generation For Equipment Failture & Cobble Reduction Based on Data Analytics And Video Analytics at BRM . Project Fund: 2.99 Crore, Bhilai Steel Plant, 2023-25.

Teaching

1. CS516: Parallelization Of Programs
2. CS519: High Performance Computer Architecture
3. CS251: Introduction to Language Processing
4. CS501: Computer Systems
5. CSP203: Software Tools & Technolgies Lab
6. CSL503: Computer Systems Engineering [Jointly with Prof. Santosh Biswas]
7. CS100: Software Tools & Technolgies Lab 1
8. CS300: Principles of Programming Languages [Jointly with Dr. Subhajit Sidhanta]
9. MAL505: Database Management Systems [Jointly with Dr. Souradyuti Paul]
10. Online Student Training Programme (STP) On Compiler Design, Organized by CSVTU and IIT Bhilai (March 21-25 2021)

Student Mentoring

- **Ph.D:**
  - Niharika Nayak
  - Surendra Kumar Raut
  - Kishan Tamboli
- **M.Tech:**
  - Raviteja Nandam
  - Amitesh Singh
  - Ranjith Vutnoor (Graduated in 2023)
  - Apurva Dorga (Graduated in 2023)

Awards

1. Recipient of **Student Innovation Award** in HPEC, 2019
2. **Nominated for Best Paper Award** in PACT, 2019
3. Recipient of **Tata Consultancy Services (TCS) Ph.D. Fellowship** from Jan 2014 to June 2018.
4. Recipient of **Best Poster Award** in HiPC, Student Research Symposium, 2017
5. Recipient of **Best Poster Award** in IBM Research Day, IIT Kanpur, 2017
6. Recipient of **Institute Medal** for academic excellence in B.Tech, CSE, VNIT Nagpur, 2009.
7. Awarded **Academic Excellence Prize** for academic excellence in B.Tech, CSE, VNIT Nagpur, 2009.
8. Recipient of **Dr.V.M. Dokras Felicitation Committee Prize** for academic excellence in 3^{rd} year B.Tech, CSE, VNIT Nagpur, 2008.
9. Recipient of **Academic Excellence Prize** for academic excellence in 3^{rd} year B.Tech, CSE, VNIT Nagpur, 2008.

10. Recipient of **Dr.S.G.Ghangrekhar Prize** for excellence in Mathematics in B.Tech, VNIT Nagpur, 2006

Talks/Presentations

- *High Performance Distributed Graph Neural Networks*, NSM HPC Research Week, IIT Madras, November 2023
- *Graphics Processing Units, Guest Lecture*, G. H. Raisoni College of Engineering, 2022
- *Introduction to Parallel Architectures*, NSM-Computer Architecture Winter School (NSM-CAWS), 2021
- *GPU Architectures and CUDA Programming*, NSM-Computer Architecture Winter School (NSM-CAWS), 2021
- *Graph Processing on GPUs*, at HiPC Programming Contest (GPU Track), 2021
- *Introduction to GPUs, CUDA Programming, Optimizations, and Research Directions*, at Computer Architecture Winter School (CAWS), 2020
- *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 2016.

Professional Service

- **2024:**
  - Program Committee, HiPC 2024
  - Poster Co-Chair, HiPC 2024
  - Reviewer, TACO, 2024
- **2023:**
  - Program Committee, HiPC 2023
  - Publicity Co-Chair, HiPC 2023
- **2022:**
  - Program Committee, WDFHC 2022
  - Publicity Co-Chair, HiPC 2022
  - Reviewer, JPDC 2022
- **2021:**
  - Organizing Committee, NSM-CAWS 2021
  - Publicity Chair, HiPC 2021

  - Organizing Committee, HiPC Programming Contest (GPU Track)
  - Organizing Committee, PPEE 2021
  - Reviewer, JPDC
  - Member of Master Thesis Evaluation Committee of a Student, NTNU
- **2020:**
  - Program Committee, PPoPP Artifact Evaluation
  - Organizing Committee, CAWS 2020
  - Reviewer, PACT and IPDPS (Joint reviewer)
  - Member of Master Thesis Evaluation Committee of a Student, NTNU
- **2019:**
  - Reviewer, PACT
  - Member of Master Thesis Evaluation Committee of a Student, NTNU
- **2017:**
  - Reviewer, HiPC SRS and ICCI
- **2016:**
  - Reviewer, TOPC