

# Vishwesh Jatala

## Assistant Professor

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## Research Interests

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

## Education

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### 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

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- 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

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1. 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
2. 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.
3. David P. Bunde, Kishwar Ahmed, Sridevi Ayloo, Tisha Brown-Gaines, Joel Fuentes, **Vishwesh Jatala**, Ruth Kurniawati, Işıl Öz, 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.
4. 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.

5. 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.
6. **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.
7. 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**].
8. 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**].
9. **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.
10. **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**].
11. **Vishwesh Jatala**, Jayvant Anantpur, and Amey Karkare, Scratchpad Sharing in GPUs, in ACM Transactions on Architecture and Code Optimization (**TACO**), 2017.
12. **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.
13. **Vishwesh Jatala**, Jayvant Anantpur, and Amey Karkare, Resource Sharing for GPUs, Code Generation and Optimization (**CGO**, Poster Track), Barcelona, Spain, 2016.

## Technical Reports

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- **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

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- **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 Bhiar. 2022-25.
- Gagan Raj Gupta, **Vishwesh Jatala (Co-PI)** Digital Transformation System For Pre-Failure Alert Generation For Equipment Failure & Cobble Reduction Based on Data Analytics And Video Analytics at BRM . Project Fund: 2.99 Crore, Bhilai Steel Plant, 2023-25.

## Teaching

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1. CS251: Introduction to Language Processing (July 2023 - Dec 2023)

2. CSL503: Computer Systems Engineering (July 2023 - Dec 2023) [Jointly with Prof. Santosh Biswas]
3. CS100: Software Tools & Technologies (March 2023 - May 2023)
4. CS516: Parallelization Of Programs *July 2022 - Dec 2022*
5. CS501: Computer Systems *Sept 2022 - Dec 2022*
6. CS251: Introduction to Language Processing *Dec 2021 - March 2022*
7. CS519: High Performance Computer Architecture *Dec 2021 - May 2022*
8. CS251: Introduction to Language Processing *Dec 2021 - March 2022*
9. CS516: Parallelization of Programs *July 2021 - Dec 2021*
10. Online Student Training Programme (STP) on Compiler Design, Organized by IIT Bhilai and CSVTU *March 21 -25, 2021*
11. CS251: Introduction to Language Processing *Dec 2020 - March 2021*
12. CS300: Principles of Programming Languages [Jointly with Dr. Subhajit Sidhanta] *July 2020 - Nov 2020*

## Student Mentoring

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- **Ph.D:**

- Niharika Nayak
- Surendra Kumar Raut
- Kishan Tamboli

- **M.Tech:**

- Ranjith Vutnoor (Graduated in 2023)
- Apurva Dorga (Graduated in 2023)

## Awards

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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<sup>rd</sup> year B.Tech, CSE, VNIT Nagpur, 2008.
9. Recipient of **Academic Excellence Prize** for academic excellence in 3<sup>rd</sup> year B.Tech, CSE, VNIT Nagpur, 2008.

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

## Talks/Presentations

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- *Graphics Processing Units, Guest Lecture*, G. H. Rasoni 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

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- **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