Shashikant Ilager

Current Position: Postdoc Researcher
Institute of Information Systems Engineering
Vienna University of Technology (TU Wien), Austria
Linkedin: https://www.linkedin.com/in/shashikantilager/
Website: www.shashikantilager.com
Google Scholar: https://scholar.google.com/citations?user=qBnfuW4AAAAJ
Email: shashikant.ilager@gmail.com (or) shashikant.ilager@tuwien.ac.at

RESEARCH INTERESTS

- Distributed Systems, Cloud Computing, Edge Computing
- Energy Efficient Computing
- AI for Systems

EDUCATION

- ***Ph.D. in Computer Science***
  Cloud Computing and Distributed Systems (CLOUDS) Laboratory
  School of Computing and Information Systems (SCIS), University of Melbourne, Australia, Feb 2017 - Feb 2021.
  Supervisor: Professor. Rajkumar Buyya
  Thesis: Machine Learning-based Energy and Thermal Efficient Resource Management Algorithms for Cloud Data Centres. **[IEEE TCCLD Outstanding PhD Thesis Award]**
- ***Master of Technology in Computer Science***
  University of Hyderabad (UOH), India, 2014- 2016.
  [First Rank]
- ***Bachelor of Engineering in Information Science and Engineering***
  Visvesvaraya Technological University (VTU), Karnataka, India, 2009- 2013.

HONORS AND AWARDS

- IEEE Technical Committee on Cloud Computing **(TCCLD) Outstanding PhD Thesis Award**, October 2021.
- IEEE **Outstanding Service Award** for volunteer service as registration chair in CCGrid-2021 conference, Australia, May 2021.
- **Artefact Creation Grant** ($5000) from School of Computing and Information Systems (SCIS), the University of Melbourne, January 2021.
- **Best Paper Award**, ACM/IEEE CCGrid-2020 conference for paper titled 'A Data-Driven Frequency Scaling Approach for Deadline-aware Energy Efficient Scheduling on Graphics Processing Units (GPUs)', 2020.
- **AWS Research Cloud Credit** ($3000) from Amazon AWS, November 2019.
- **Excellence in Teaching Award**, Distributed Systems (COMP90015) course, School of Computing and Information Systems (given for 6 out of 200 tutors), The University of Melbourne, 2019.
- **Melbourne Research Scholarship**, The University of Melbourne, Australia, March 2017.
- **Mannapalli Subbaramaiah Gold Medal**, for securing the first rank across all three M.Tech courses (CS/AI/IT), the academic batch of 2014-2016 at SCIS, University of Hyderabad, India, July 2016.

- **State Bank of Hyderabad (SBH) Gold Medal**, for securing the first rank in M.Tech Computer Science course, the academic batch of 2014-2016 at SCIS, University of Hyderabad, India, July 2016.
- **Post Graduate (PG) Scholarship**, UGC NET, Government of India, June 2014 -July 2016.
- Qualified Graduate Aptitude Test in Engineering (GATE), a national level PG entrance examination, India, 2014.

WORK EXPERIENCE

- **Postdoctoral Researcher (fulltime)** at Institute of Information Systems Engineering, Vienna University of Technology, Austria, August 2021 - **current**.
- **Research Assistant** at CLOUDS Lab, School of Computing and Information Systems, University of Melbourne, Australia, March 2021 - July 2021.
- **Teaching Assistant (TA)/ Head Tutor (casual)** at School of Computing and Information Systems, University of Melbourne, Australia, *Distributed System Course (COMP90015)*, multiple semesters between 2019 - June 2021
- **TA (casual)** at School of Computing and Information Systems, University of Melbourne, Australia, *Distributed System Course (COMP90015) and Internet Technology Course (COMP90007)*. **[Excellence in Teaching Award-2019]**, multiple semesters between Jul 2018 - June 2021.
- **Software Engineering Intern** at *Pointed Squares Ltd* Hyderabad, India , Aug 2016 - Dec 2016.
- **Linux System Administrator** at *SCIS, UOH, India (Voluntary)*, Jul 2015 - Jun 2016.
- **Hadoop System Administrator** *GIAN Workshop, UOH India (Voluntary)*, Aug 2016.

PUBLICATIONS

Theses and Dissertations:

1. **Shashikant Ilager**, Machine Learning-based Energy and Thermal Efficient Resource Management Algorithms for Cloud Data Centres *PhD Thesis*, University of Melbourne, Australia, 2021.
2. **Shashikant Ilager**, Extending Aneka Cloud PaaS API's for GPU's, *Master's Dissertation (M.Tech)*, University of Hyderabad, India, 2016.
3. **Shashikant Ilager**, Automatic Protocol Blocker for Privacy Preserving Public Auditing in Cloud Computing, *Bachelor's Dissertation*, VTU, India, 2013.

Refereed Journal Articles:

4. **Shashikant Ilager**, Kotagiri Ramamohanarao, and Rajkumar Buyya, ETAS: Energy and Thermal-Aware Dynamic Virtual Machine Consolidation in Cloud Data Center with Proactive Hotspot Mitigation, Concurrency and Computation: Practice and Experience (CCPE), Volume 31, No. 17, Pages: 1-15, ISSN: 1532-0626, Wiley Press, New York, USA, September 2019. [**Excellence in Research for Australia (ERA)** *A* **Ranked**]
5. Shreshth Tuli, **Shashikant Ilager**, Kotagiri Ramamohanarao, and Rajkumar Buyya, Dynamic Scheduling for Stochastic Edge-Cloud Computing Environments using A3C Learning and Residual Recurrent Neural Networks, IEEE Transactions on Mobile Computing (TMC), USA (in press, accepted on Aug 13, 2020). [**ERA** A^* **Ranked**].
6. **Shashikant Ilager**, Kotagiri Ramamohanarao, and Rajkumar Buyya, Thermal Prediction for Efficient Energy Management of Clouds using Machine Learning, IEEE Transactions on Parallel and Distributed Systems (TPDS), Volume 32, No. 5, Pages: 1044-1056, ISSN: 1045-9219, IEEE CS Press, USA, May 2021. [**ERA** A^* **Ranked**].

7. Tahseen Khan, **Shashikant Ilager**, Wenhong Tian, and Rajkumar Buyya, Workload Forecasting and Energy State Estimation in Cloud Data Centers: ML-centric Approach, Future Generation Computer Systems (FGCS), Elsevier Science, Amsterdam, The Netherlands, 2021 (accepted). [**ERA** *A* **Ranked**].

8. Minxian Xu, Chenghao Song, **Shashikant Ilager**, Sukhpal Singh Gill, Juanjuan Zhao, Kejiang Ye, Chengzhong Xu, CoScal: Multi-faceted Scaling of Microservices with Reinforcement Learning, IEEE Transactions on Network and Service Management (TNSM), 2022.

Refereed Conference Papers:

9. Alessandro Tundo, Marco Mobilio, **Shashikant Ilager,** Ivona Brandic, Ezio Bartocci, Leonardo Mariani, An Energy-Aware Approach to Design Self-Adaptive AI-based Applications on the Edge. 38th IEEE/ACM International Conference on Automated Software Engineering (ASE2023), Sep 11, 2023 - Sep 15, 2023, Luxembourg. [**ERA** A^* **Ranked**].

10. **Shashikant Ilager**, Rajeev Muralidhar, Rammohanrao Kotagiri and Rajkumar Buyya, A Data-Driven Frequency Scaling Approach for Deadline-aware Energy Efficient Scheduling on Graphics Processing Units (GPUs), in proceedings of the 20th IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing (CCGrid 2020), Melbourne, Australia, May 11-14, 2020. **[Best Paper Award]**. [**ERA** *A* **Ranked**].

11. Daniel Hofstätter, **Shashikant Ilager,** Ivan Lujic, Ivona Brandić, SymED: Adaptive and Online Symbolic Representation of Data on the Edge, In the 29th International European Conference on Parallel and Distributed Computing (EuroPar23), Limassol, Cyprus, 28th August – 1st Septemeber, 2023.

12. Tharindu B. Hewage, **Shashikant Ilager**, Maria A. Rodriguez, Patricia Arroba, and Rajkumar Buyya, DEMOTS: A Decentralized Task Scheduling Algorithm for Micro-Clouds with Dynamic Power-Budgets, Proceedings of the 16th IEEE International Conference on Cloud Computing (IEEE Cloud 2023, IEEE CS Press, USA), Chicago, USA, July 2-8, 2023.

13. **Shashikant Ilager**, Jakob Fahringer, Samuel Carlos de Lima Dias, Ivona Brandic, DEMon: Decentralized Monitoring for Highly Volatile Edge Environments, In Proceedings of the 15th IEEE/ACM International Conference on Utility and Cloud Computing (UCC2022), Vancouver, Washington, USA, December 6-9, 2022.

14. **Shashikant Ilager**, Rajeev Muralidhar, and Rajkumar Buyya, Artificial Intelligence (AI)-Centric Management of Resources in Modern Distributed Computing Systems, in proceedings of the IEEE Cloud Summit, Harrisburg, PA, USA, 2020.

15. **Shashikant Ilager**, Prasad, P. S. V. S, Scalable MapReduce-based Fuzzy Min-Max Neural Network for Pattern Classification, in proceedings of the 18th ACM International Conference on Distributed Computing and Networking (ICDCN 2017) , Hyderabad, India, January 2017.

Book Chapters:

16. **Shashikant Ilager**, Rajeev Wankar, Raghavendra Kune, and Rajkumar Buyya, GPU PaaS Computation Model in Aneka Cloud Computing Environments, Smart Data: State-of-the-Art Perspectives in Computing and Applications, K. Li, Q. Zhang, L. Yang, B. Martino (eds), ISBN-13: 978-1138545588, Chapman Hall/CRC Press, USA, March 28, 2019.

17. Minxian Xu, Chengxi Gao, **Shashikant Ilager**, Huaming Wu, Chengzhong Xu, and Rajkumar Buyya, Green-aware Mobile Edge Computing for IoT: Challenges, Solutions and Future Directions, Mobile Edge Computing (MEC), A. Mukherjee, D. De, S. K. Ghosh, and R. Buyya (eds), Springer, USA (in press).

PROFESSIONAL SERVICE

- **Organization Committee:** IC2E 2021/2022, CCGrid 2021.
- **Program Committee Member:** IEEE CLOUD 2021, AuSPDC 2022, IoIot 2022, ICDCS 2020, Eurosys shadow PC 2020.
- **Reviewer:** ACM CSUR, IEEE TMC, IEEE ToN, IEEE TPDS, IEEE TSC, IEEE TUSC, Wiley SPE, Wiley CCPE, Elsevier FGCS.
- **Subreviewer:** SC, HiPC, HPDC, CCGRID, EuroPar, EuroSys, Asia-Pacific HPC, IC2E.
- **Co-Chair**, International Workshop on Multi-tier Big Data Pipelines from Edge to the Cloud Data Centers, 26th IEEE International Conference on High-Performance Computing, Data and Analytics, December (HiPC), December 17-20, 2019, Hyderabad, India.
- **Guest Editor**, Vlado Stankovski, Rajkumar Buyya, Shrideep Pallickara, Shashikant Ilager, Special Issue on Multi-tier Big Data Pipelines from Edge to the Cloud Data Centers", Software: Practice and Experience (SPE), February 2020, New York, USA.

MENTORING AND SUPERVISION

During my PhD at UniMelb Australia and PostDoc at TU Wien Austria, I supervised more than ten student theses; many of them have resulted in publications or manuscripts under submission.

1. Mr. Tharindu Bandara, PhD Thesis, *Carbon-aware Resource Management in Edge-Cloud Systems*, UniMelb, Australia (remote supervision along with Prof. Raj Buyya and Dr Maria Read), 2021- now.
2. Ms. Viktorija Pruckovskaja, Master Thesis, *Performance Analysis of Federated Learning Algorithms for Industrial use cases*, TU Wien + AIT, Austria, November 2023.
3. Ms. Meerzhan Kanatbekova, Master Thesis, *Symbolic Data Representation of Multi-Media Data on Edge*, TU Wien, May 2022- November 2022.
4. Mr. Mayank Jha, Master Thesis, *Statistical Characterization of a Cloud Data Center*, TU Wien + University of L'aquila, Italy, Feb-2022 – November 2022.
5. Mr. Jakob Fahringer, Bachelor Thesis, *Decentralized Monitoring in Edge*, TU Wien, Feb - October 2022.
6. Shreshth Tuli, Semester project: *RL-based Scheduling in Edge-Cloud*, UniMelb, Australia, 2020.
7. Nipum Basumati, Semester project: *RL-based Scheduling in Edge-Cloud*, UniMelb, Australia, 2020.
8. Tahseen khan, Semester project: *Workload Forecasting in Cloud*, UniMelb, Australia, 2021.
9. Ms. Radhika Chhikara, Master Thesis, *Parallel Processing of Power-BI Applications using Ankea*, UniMelb, Australia, Jan 2019- June 2019.

PRESENTATION AND INVITED TALKS

- Data-Centric Edge-AI, IEEE Services, Chicago, USA, 2023.
- DEMon: Decentralized Monitoring in Highly Volatile Edge, IEEE UCC, Washington, USA, 2023.
- Programming Abstractions in Cloud, Invited Guest Lecture for Internet Technology Course (Semester 2, 2021), Faculty of Engineering and Information Technology, University of Melbourne, Australia, September 2021 (online).
- A Data-Driven Frequency Scaling and Energy Efficient Scheduling on GPUs, Proceedings of the IEEE CCGRID, May 2021 (online).
- A Data-Driven Frequency Scaling and Energy Efficient Scheduling on GPUs, Vienna University of Technology (TU Wien), March , 2021 (online)

- Artificial Intelligence (AI)-Centric Management of Resources in Modern Distributed Computing Systems, In Proceedings of the IEEE Cloud Summit, Harrisbury, Pennsylvania, USA, October 21-22, 2020. (online).
- Programming the Cloud: Towards Serverless Computing, Invited Talk, Faculty Development Workshops, GMR Institute of Technology,, AP, India, June 2020 (online).
- ETAS: Energy and Thermal-Aware Dynamic Virtual Machine Consolidation in Cloud Data Center with Proactive Hotspot Mitigation, 6th CIS Annual Doctoral Colloquium at the University of Melbourne, Melbourne, Australia, July 2018.
- Scalable MapReduce-based Fuzzy Min-Max Neural Network for Pattern Classification, 18th International Conference on Distributed Computing and Networking (ICDCN, 2017), Hyderabad, India, January 2017.
- Heterogeneous Parallel Computing on Clouds using Aneka PaaS Tool, *Invited Talk*, One Week National Level Research-Oriented Workshop on Cloud and GPU Computing (Cloud-GPU 2016), Jawaharlal Nehru Technological University (JNTU), Kakinada, India, August 8-12, 2016.
- Heterogeneous Parallel Computing using CUDA Toolkit, *Invited Talk*, CVR College of Engineering, Hyderabad, India, March 2016.

TECHNICAL SKILLS

- Teaching
  - Expert in hands-on teaching of computer science and engineering subjects including distributed systems, parallel computing, Cloud computing, and networking, both in-person and online.
- Programming Languages and Frameworks
  - Proficient in C, CUDA C, Python, .NET C# and Java
  - Familiar with Big data frameworks, Spark, Hadoop and Twister's MapReduce framework, HTML, SQL and LaTeX.
  - Experience in working with Kubernetes, ML- frameworks such as sci-kit learn, tensor-flow, tensor-flow-light, and pytroch
- Tools and Systems
  - AWS and Azure Cloud, Apache web server frameworks, Hadoop, Xen Hypervsior for virtualization, VirtualBox, Development Environments (IntelliJ IDEA, PyCharm, and Visual Studio)
  - Operating Systems: Proficient in Linux (openSUSE, Debian) and familiar with Microsoft Windows family.

LANGUAGES KNOWN

English(Functional and Fluent), Hindi (Fluent), Kannada (Mother Tongue), Marathi (Fluent), German (Basic knowledge).