# Asif Imran

Assistant Professor of Teaching
Department of Computer Science and Engineering
University at Buffalo (SUNY)
Buffalo, NY 14260, USA

asifimra@buffalo.edu

## Academic and Research Interests

My academic interest focuses on student success. My efforts are focused on teaching students about the different topics of computer science and engineering. My research interest focuses on working with students to optimize software resource utilization through code smell refactoring in software running on a cloud environment. My efforts combine software engineering, and machine learning to design and develop solutions that optimize energy usage.

## Education

**Ph.D.**, Computer Science and Engineering, **University at Buffalo**, Amherst, NY 14260, USA, awarded: July 2022
Thesis: Prediction and analysis of impact on resource usage due to code smell refactoring
Advisor: Prof. Tevfik Kosar

**MS**, Software Engineering, **IIT, University of Dhaka**, Dhaka 1000, Bangladesh, July 2014
Thesis: Provenance based security assurance in cloud computing
Advisor: Prof. Kazi Muheymin-us Sakib

**BS**, Information Technology, **IIT, University of Dhaka**, Dhaka 1000, Bangladesh, December 2012

## Academic Experience

- ABET Committee member at CSUSM, Dept. of Computer Science and Software Engineering, California State University San Marcos, CA, USA, 2022
- Research assistant, Dept. of Computer Science and Engineering, University at Buffalo, NY, USA, 2021
- Research intern, IBM T. J. Watson Research Lab, Yorktown Heights, NY, USA, 2020
- Course instructor, Dept. of Computer Science and Engineering, University at Buffalo, NY, USA, 2019
- Teaching Assistant of Operating Systems, Dept. of Computer Science and Engineering, University at Buffalo, NY, USA, 2018
- Teaching Assistant of Parallel and Distributed Programming, Dept. of Computer Science and Engineering, University at Buffalo, NY, 2017

- Lecturer, Institute of Information Technology (IIT), University of Dhaka, Bangladesh, 2014-2017

# Grants

2026 SUNY-IBM AI Research Alliance grant winner: amount funded USD 100,000

2024 NSF EAGER grant winner: amount funded USD 125,000

2023 CSUSM Summer Grant Writing Bootcamp

# Publication

## Refereed Journal Articles

1. Imran, A. and Kosar, T., 2021. Software Sustainability: A Systematic Literature Review and Comprehensive Analysis. Journal of Systems and Software, Elsevier publications (under review).

2. Imran, A., Aljawarneh, S.A. and Sakib, K., 2016. Web data amalgamation for security engineering: Digital forensic investigation of open source cloud. J. Univers. Comput. Sci., 22(4), pp.494-520.

3. Imran, A., Ul Gias, A., Rahman, R. and Sakib, K., 2013. Provintsec: a provenance cognition blueprint ensuring integrity and security for real life open source cloud. International Journal of Information Privacy, Security and Integrity, 1(4), pp.360-380.

## Refereed Conference Articles

4. Kumar, P., Imran, A. and Kosar, T., 2026. Energy Consumption of Dataframe Libraries for End-to-End Deep Learning Pipelines: A Comparative Analysis. (Accepted at ICSE GREENS 2026)

5. Islam M.A., Jonnala D.P., Rekhi R., Pokharel P., Cilamkoti S., Imran, A., Kosar T., Turkan B. (2025). Evaluating the Energy-Efficiency of the Code Generated by LLMs. Submitted to the 3rd International Conference on Foundation and Large Language Models (FLLM2025)

6. Shah R.N., Kallur R.S., Prash Y., Yerabati S., Rahman M. L., Imran, A. (2024). Predicting Future Ratings of Amazon Products Based on the Users' Prior Reviews. In Proceedings of the International Conference and Workshop on Computing and Communication (IEMCON), pages 287-291. DOI: 10.1109/IEMCON62851.2024.11093548.

7. Imran, A., Kosar, T., Zola J., Bulut M.F. (2024). Towards Sustainable Cloud Software Systems through Energy-Aware Code Smell Refactoring. In Proceedings of the 2024 IEEE 17th International Conference on Cloud Computing (CLOUD), pages 223-234. DOI: 10.1109/CLOUD62652.2024.00034.

8. Shah R.N., Mohamed S.A., Imran, A., Kosar T. (2023). CloudScent: a model for code smell analysis in open-source cloud. In Proceedings of the 2023 IEEE International Conference on Cloud Computing Technology and Science (CloudCom), pages 69-75. DOI: 10.1109/CloudCom59040.2023.00024.

9. Imran, A. (2023). Investigate How Developers and Managers View Security Design in Software. In Proceedings of the 18th International Conference on Evaluation of Novel Approaches to Software Engineering, ISBN 978-989-758-647-7, ISSN 2184-4895, pages 693-700. DOI: 10.5220/0011994700003464.

10. Imran, A. and Kosar, T., 2022. URegM: a unified prediction model of resource consumption for refactoring software smells in open-source cloud. In 2022 3rd ACM European Symposium on Software Engineering (ESSE), ACM.

11. Imran, A. and Kosar, T., 2022. Qualitative analysis of the relationship between design smells and software engineering challenges. In 2022 3rd ACM European Symposium on Software Engineering (ESSE), ACM.

12. Imran, A. and Kosar, T., 2020. The Impact of Auto-Refactoring Code Smells on the Resource Utilization of Cloud Software. In 2020 International Conference on Software Engineering and Knowledge Engineering (SEKE), KSI Research.

13. Imran, A., 2019, September. Design smell detection and analysis for open source java software. In 2019 IEEE International Conference on Software Maintenance and Evolution (ICSME) (pp. 644-648). IEEE.

14. Nine, M.S.Z., Di Tacchio, L., Imran, A., Kosar, T., Bulut, M.F. and Hwang, J., 2018, December. Greendataflow: Minimizing the energy footprint of global data movement. In 2018 IEEE International Conference on Big Data (Big Data) (pp. 335-342). IEEE.

15. Imran, A., Nine, M.S., Guner, K. and Kosar, T., 2018, January. Onedatashare-a vision for cloud-hosted data transfer scheduling and optimization as a service [onedatashare-a vision for cloud-hosted data transfer scheduling and optimization as a service]. In Proceedings of the 8th International Conference on Cloud Computing and Services Science (Vol. 1).

16. Rawshan, L., Islam, J. and Imran, A., 2016. Identifying Overloaded Servers and Managing Dynamic Placement of Virtual machines in Cloud. International Journal of Computer Applications, 975, p.8887.

17. Shamsuddoha, M., Alam, M.S., Asif, S.A., Aljawarneh, S., Sakib, K. and Imran, A., 2015, September. CLBS-3: A Three-Tier Load Balancer for ensuring Fault-Tolerance of Software running in Open-Source Cloud. In Proceedings of the The International Conference on Engineering MIS 2015 (pp. 1-5).

18. Rawshan, L., Sakib, K. and Imran, A., 2015, September. Time-Waved Monitoring and Emergent Self Adaption of Software Components in Open Source Cloud. In Proceedings of the The International Conference on Engineering MIS 2015 (pp. 1-6).

19. Hasan, T., Imran, A. and Sakib, K., 2014, December. A case-based framework for self-healing paralysed components in Distributed Software applications. In The 8th International Conference on Software, Knowledge, Information Management and Applications (SKIMA 2014) (pp. 1-7). IEEE.

20. Imran, A., Dey, E.K. and Sakib, K., 2014. Active-Threaded Algorithms for Provenance Cognition in the Cloud preserving Low Overhead and Fault Tolerance. In 2014 Recent Advances in Information and Communication Technology (pp. 249-255).

21. Gias, A.U., Rahman, R., Imran, A. and Sakib, K., 2014. TFPaaS: Test-first Performance as a Service to Cloud for Software Testing Environment. In 2013 International Conference on Innovative Technologies (INTECH) (pp. 20-32).

22. Imran, A., Nahar, N. and Sakib, K., 2014, May. Watchword-oriented and time-stamped algorithms for tamper-proof cloud provenance cognition. In 2014 International Conference on Informatics, Electronics Vision (ICIEV) (pp. 1-6). IEEE.

23. Imran, A., Gias, A.U., Rahman, R., Seal, A., Rahman, T., Ishraque, F. and Sakib, K., 2014, March. Cloud-niagara: A high availability and low overhead fault tolerance middleware for the cloud. In 16th Int'l Conf. Computer and Information Technology (pp. 271-276). IEEE.

24. Rahman, R., Imran, A., Gias, A.U. and Sakib, K., 2013, August. A peer to peer resource provisioning scheme for cloud computing environment using multi attribute utility theory. In Third International Conference on Innovative Computing Technology (INTECH 2013) (pp. 132-137). IEEE.

25. Gias, A.U., Imran, A., Rahman, R. and Sakib, K., 2013, August. IVRIDIO: Design of a software testing framework to provide Test-first Performance as a service. In Third International Conference on Innovative Computing Technology (INTECH 2013) (pp. 520-525). IEEE.

26. Imran, A., Gias, A.U. and Sakib, K., 2012, July. An empirical investigation of cost-resource optimization for running real-life applications in open source cloud. In 2012 International Conference on High Performance Computing Simulation (HPCS) (pp. 718-723). IEEE.

27. Khaled, S.M., Islam, M.S., Rabbani, M.G., Tabassum, M.R., Gias, A.U., Kamal, M.M., Muctadir, H.M., Shakir, A.K., Imran, A. and Islam, S., 2009, November. Combinatorial color space models for skin detection in sub-continental human images. In International Visual Informatics Conference (pp. 532-542). Springer, Berlin, Heidelberg.

### Publication in progress

28. Imran, A., Kosar, T., Zola, J., Bulut, F., 2021. The Impact of Code Smell Auto-refactoring on Application Resource Consumption. Submitted to the International Conference on Software Engineering (ICSE).

### Other publications

29. Ami, A.S., Imran, A., Gias, A.U. and Sakib, K., 2020. Effects of Internship on Fresh Graduates: A case study on IIT, DU students. arXiv preprint arXiv:2008.07450.

30. Tabassum, M.R., Gias, A.U., Kamal, M., Muctadir, H.M., Ibrahim, M., Shakir, A.K., Imran, A., Islamm, S., Rabbani, M., Khaled, S.M. and Islam, M., 2010. Comparative study of statistical skin detection algorithms for sub-continental human images. arXiv preprint arXiv:1008.4206.

## Conference presentations

1. "Investigate How Developers and Managers View Security Design in Software.". 18th International Conference on Evaluation of Novel Approaches to Software Engineering (ENASE 2023), Prague, Czech Republic, April 2023.

2. "Eliminating code smells for greener software". Three minute thesis competition, University at Buffalo, NY, USA, February 2021.

3. "Analysis of software code smells and their affect on cloud resource usage". IBM intern talk. IBM T. J. Watson research Center, NY, USA, November 2020.

4. "Impact of batch refactoring code smells on software resource consumption". International Conference on Software Engineering and Knowledge Engineering (SEKE 2020), Pittsburgh, PA, USA, July 2020.

5. "Design Smell Analysis for Developing and Established Open Source Java Software". The International Conference on Software Maintenance and Evolution (ICSME), Cleveland, OH, USA, November 2019.

6. "How smells in large scale distributed software affect cpu and memory consumption?". CSE Grad Upbeat at University at Buffalo, NY, USA, November 2019.

7. "Improving software sustainability by elimination of code smells". Second Workshop on Software Sustainability. Organized by US Research Software Sustainability Institute, University of Illinois at Urbana-Champaign, October 2019.

8. ”CLBS-3: A Three-Tier Load Balancer for ensuring Fault-Tolerance of Software running in Open-Source Cloud”. The International Conference on Engineering and MIS, Istanbul, Turkey, June 2015.
9. ”TFPaaS: Test first Performance as a Service to Cloud for Software Testing Environment”. International Conference on Innovative Technologies (INTECH), London, UK, March 2014.
10. A peer to peer resource provisioning scheme for cloud computing environment using multi attribute utility theory. International Conference on Innovative Technologies (INTECH), London, UK, March 2014.
11. Cloud-niagara: A high availability and low overhead fault tolerance middleware for the cloud. IEEE International Conference on Computer and Information Technology (ICCIT), Dhaka, Bangladesh, February 2013.
12. ”An empirical investigation of cost-resource optimization for running real-life applications in open source cloud.” International Conference on High Performance Computing and Simulation (HPCS), Madrid, Spain, July 2012.

## Teaching Experience

| Semester | Course code | Course title | Number of students | Institution |
|---|---|---|---|---|
| Fall 2025 | CSE 368 | Introduction to Artificial Intelligence | 151 | Univ. at Buffalo |
| Fall 2025 | CSE 411 | Introduction to Comp Sys Admin | 75 | Univ. at Buffalo |
| Spring 2025 | CSE 474 | Introduction to Machine Learning | 110 | Univ. at Buffalo |
| Spring 2025 | CSE 574 | Introduction to Machine Learning | 230 | Univ. at Buffalo |
| Fall 2024 | CSE 574 | Introduction to Machine Learning | 278 | Univ. at Buffalo |
| Fall 2023 | CS 542 | Software Design Patterns | 14 | Cal State University San Marcos |
| Fall 2023 | SE 481 | Software Project Management | 21 | Cal State University San Marcos |
| Fall 2023 | SE 451 | Software Requirements and Design | 32 | Cal State University San Marcos |
| Spring 2023 | SE 370 | Software Engineering | 33 | Cal State University San Marcos |
| Spring 2023 | CS 370 | Software Engineering | 40 | Cal State University San Marcos |
| Fall 2022 | CS 542 | Software Design Patterns | 24 | Cal State University San Marcos |
| Fall 2022 | CS 441 | Software Engineering | 36 | Cal State University San Marcos |
| Fall 2019 | CSE 421 | Operating Systems | 124 | Univ. at Buffalo |
| Summer 2019 | CSE 421 | Operating Systems | 14 | Univ. at Buffalo |
| Summer 2019 | CSE 478 | Computer Vision and Image Processing | 17 | Univ. at Buffalo |
| Spring 2019 | CSE 421 | Operating Systems | 110 | Univ. at Buffalo |
| Fall 2018 | CSE 421 | Operating Systems | 131 | Univ. at Buffalo |
| Spring 2018 | CSE 421 | Operating Systems | 122 | Univ. at Buffalo |
| Fall 2017 | CSE 481 | Parallel and Distributed Programming | 32 | Univ. at Buffalo |

## Reference

**Dr. Tevfik Kosar**, Professor, Dept. of Computer Science and Engineering, University at Buffalo and Program Director at NSF

Phone: 716-645-2323 Email: `tkosar@buffalo.edu`

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