

Keheliya Gallaba

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🔍 Google Scholar Profile: https://scholar.google.ca/citations?user=FF_M_CEAJJ&hl=en
🔗 DBLP: <https://dblp.uni-trier.de/pers/hd/g/Gallaba:Keheliya>

SUMMARY

- Published in top-tier (**CORE Rank: A* & A**) Software Engineering research journals & conferences (**ICSE, TSE, FSE, ASE**) in the areas of CI/CD, programming languages, AI4SE, and SE4AI.
- Won ACM SIGSOFT Distinguished Paper Award at **ASE '25** and best paper award at **ESEM '15**.
- Research interests: Mining large-scale data sources in software engineering (i.e., **GitHub, StackOverflow, CircleCI & TravisCI**) to improve software engineering processes and tools.
- Mentored 12 students to get research published in premier conference in Mining Software Repositories.
- Successful collaborations with distributed research teams in **Canada, Japan, Austria, and USA**.
- Experienced in building developer tools at scale for **Microsoft Research, Fortinet, WS02 & Huawei**.
- Canadian citizen.

EDUCATION

McGill University, Montréal, QC, Canada

Ph.D. in Software Engineering Sep 2016 – Nov 2021
Thesis: Improving the Robustness and Efficiency of Continuous Integration and Continuous Deployment
Advisor: Prof. Shane McIntosh
Publications: MSR17a, MSR17b, MSR18a, MSR18b, TSE18, ASE18, MSR19, ICSME19, TSE20, ICSE22.

University of British Columbia, Vancouver, BC, Canada

M.A.Sc. in Software Engineering Jan 2014 – Dec 2015
Thesis: Characterizing and refactoring asynchronous JavaScript callbacks
Advisors: Prof. Ali Mesbah and Prof. Ivan Beschastnikh
Publications: ESEM15, ICSME17.

University of Moratuwa, Moratuwa, Sri Lanka

B.Sc. (Hons.) in Computer Science and Engineering May 2007 – Nov 2011
Thesis: An analysis of BPMN 2.0 as a business process execution language
Advisors: Vishaka Nanayakkara and Dr Milinda Pathirage
Publications: CeBPM12.

CURRENT EMPLOYMENT

Waterloo Centre for Software Excellence, Huawei Canada, 1055 Princess St., Kingston, ON, Canada

Staff Researcher, Foundation Models & Software Engineering Group Jun 2021 – Present
Supervisor: Prof. Ahmed E. Hassan
Conducting research at the intersection of AI and Software Engineering, driving innovation from conception to impact. Authoring peer-reviewed papers in top-tier venues to disseminate key findings and establish thought leadership. Fostered community collaboration and knowledge sharing by co-organizing international conferences and workshops. Translated research into tangible business assets by filing 4 patent applications.

RESEARCH EXPERIENCE

YourBase Inc., Redmond, WA, USA

Visiting Researcher Jun 2019 – Jul 2020
Supervisors: Yves Junqueira and John Ewart
Focus: Accelerating continuous integration by caching environments and inferring dependencies.

Microsoft Research, Cambridge, UK

PhD Research Intern, Systems and Networking Group Jun 2018 – Sep 2018
Supervisors: Dr Katja Kevic and Dr Brendan Murphy
Focus: Automatic removal of feature gates in source code.

TEACHING EXPERIENCE

Visiting Instructor

Queen's University, Kingston, ON, Canada
CISC877 Software Engineering and Foundation Models Fall 2023 & Winter 2025
University of Moratuwa, Sri Lanka
CS2212 Programming Challenge II May 2011 – Sep 2011
CS2202 Programming Challenge Sep 2010 – Dec 2010

Teaching Assistant

McGill University, Montréal, QC, Canada ECSE321 Introduction to Software Engineering	Fall 2017
University of British Columbia, Vancouver, BC, Canada EECE416 Software Testing and Analysis EECE310 Software Engineering	Winter II 2014 Winter II 2013 & Winter I 2014

Curriculum Committee Member & Instructor

Alware Bootcamp Mini 2025, Ottawa, ON, Canada [link] Co-located with ICSE'25, 50 attendees	May 2025
Alware Leadership Bootcamp 2024, Toronto, ON, Canada [link] 80 attendees (Primarily graduate students and SE faculty)	Nov 2024

Curriculum Committee Member

The Hitchhiker's Guide to Production-ready Trustworthy Foundation Model-Powered Software (FMware) [link] 3-hour lecture-style tutorial at KDD'25, Toronto, Canada	Jul 2025
A Tutorial on Software Engineering for FMware [link] 1.5-hour tutorial at FSE'25, Trondheim, Norway	Jun 2025

INDUSTRIAL EXPERIENCE

Wise Systems Inc., Montréal, QC, Canada

Senior Software Engineer Developing features for AI-driven dispatch and routing software that enable last mile delivery, improving fleet efficiency and customer service through machine learning and real-time data.	Aug 2020 – Apr 2021
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Fortinet Inc., Vancouver, BC, Canada

Software Development Engineer II , Forticlient Team Worked on the system for generating software vulnerability signatures, validating them, and delivering them to endpoint security software (Forticlient).	Feb 2016 – Aug 2016
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WSO2 Inc., Colombo, Sri Lanka

Senior Software Engineer , Integration Technologies Team Development and support of open source middleware solutions for enterprise integration problems. PoC development, deployment, and on-site support for clients in US, Switzerland, Sweden, and New Zealand.	Apr 2013 – Nov 2013
Software Engineer , Integration Technologies Team Worked with WSO2 Business Process Server, Enterprise Service Bus, Identity Server & Governance Registry. Experience with WS-BPEL & other WS-* standards, SOAP/REST web services. XPATH, XSLT, Apache ODE and Eclipse plug-in development.	Dec 2011 – Mar 2013

AWARDS & RECOGNITION

ACM SIGSOFT Distinguished Paper Award Awarded at the 40th IEEE/ACM International Conference on Automated Software Engineering (ASE '25).	Nov 2025
Mitacs Accelerate International Award and Graduate Mobility Award Funding to study and conduct research abroad as part of the McGill degree program. Award Amount: \$6,700	May 2019
FRQNT Doctoral Research Award (Bourses de doctorat en recherche) Ranked #1 in the ICT group and obtained the competitive scholarship provided by Fonds de recherche du Québec – Nature et technologies (FRQNT). Award Amount: \$28,000	May 2018
McGill Engineering Doctoral Award (MEDA) Full scholarship with stipend for PhD studies at McGill University. Award Amount: \$96,000	2016 – 2019
Best Full Paper Award Awarded at The ACM/IEEE International Symposium on Empirical Software Engineering and Measurement.	Oct 2015
ISERN Student Travel Grant Awarded by The International Software Engineering Research Network (ISERN) to attend ESEM '15.	Oct 2015
Manthan Award South Asia for e-Localization For creating tools that allowed viewing non-Unicode Sinhala language content on Unicode-enabled computers.	Dec 2010
e-Swabhimani 2010 award for e-Localization Awarded at the National Best e-Content Awards, Sri Lanka.	Nov 2010

COMPLETE LIST OF PUBLICATIONS

FULL PAPERS IN INTERNATIONAL JOURNALS (CORE RANK: A*)

- [TSE20] K. Gallaba, Y. Junqueira, J. Ewart, and S. McIntosh, "Accelerating Continuous Integration by Caching Environments and Inferring Dependencies," *IEEE Transactions on Software Engineering*, 48(6): pp. 2040–2052, 2020. [[PDF](#)]
- [TSE18] K. Gallaba and S. McIntosh, "Use and Misuse of Continuous Integration Features: An Empirical Study of Projects that (mis)use Travis CI," *IEEE Transactions on Software Engineering*, 46(1): pp. 33–50, 2018. [[PDF](#)]

FULL PAPERS IN INTERNATIONAL CONFERENCES (CORE RANK: A* & A)

- [ASE25] N. Nashid, D. Ding, K. Gallaba, A. E. Hassan, and A. Mesbah, "Characterizing Multi-Hunk Patches: Divergence, Proximity, and LLM Repair Challenges", In *Proceedings of the International Conference on Automated Software Engineering (ASE)*, To Appear, Nov 2025. **🏆 ACM SIGSOFT Distinguished Paper Award** [[PDF](#)]
- [KDD25] K. Vasilevski, B. Rombaut, G. K. Rajbahadur, G. A. Oliva, K. Gallaba, F. R. Cogo, D. Lin, H. Zhang, B. Chen, K. Thangarajah, A. E. Hassan, Z. M. Jiang, "The Hitchhikers Guide to Production-ready Trustworthy Foundation Model powered Software (FMware)", In *Proceedings of the ACM SIGKDD Conference on Knowledge Discovery and Data Mining*, 6162–6172, Jul 2025. [[PDF](#)]
- [ASE24] M. Yin, Y. Kashiwa, K. Gallaba, M. Alfadel, Y. Kamei, and S. McIntosh, "Developer-Applied Accelerations in Continuous Integration: A Detection Approach and Catalog of Patterns", In *Proceedings of the International Conference on Automated Software Engineering (ASE)*, 1655–1666, Oct 2024. [[PDF](#)]
- [FSE24] A. E. Hassan, D. Lin, G. K. Rajbahadur, K. Gallaba, F. R. Cogo, B. Chen, H. Zhang, K. Thangarajah, G. A. Oliva, J. Lin, W. M. Abdullah, Z. M. Jiang, "Rethinking Software Engineering in the Foundation Model Era", In *Companion Proceedings of the International Conference on the Foundations of Software Engineering (FSE)*, 294–305, Jul 2024. [[PDF](#)]
- [ICSE22] K. Gallaba, M. Lamothe, and S. McIntosh, "Lessons from Eight Years of Operational Data from a Continuous Integration Service: A Case Study of CircleCI", In *Proceedings of the International Conference on Software Engineering (ICSE)*, 1330–1342, May 2022. **🏆 Nominated for ACM SIGSOFT Distinguished Paper Award** [[PDF](#)]
- [ASE18] K. Gallaba, C. Macho, M. Pinzger, and S. McIntosh, "Noise and Heterogeneity in Historical Build Data: An Empirical Study of Travis CI", In *Proceedings of the International Conference on Automated Software Engineering (ASE)*, 87–97, Sep 2018. [[PDF](#)]
- [ICSME17] K. Gallaba, Q. Hanam, A. Mesbah, and I. Beschastnikh, "Refactoring Asynchrony in JavaScript", In *Proceedings of the International Conference on Software Maintenance and Evolution (ICSME)*, 353–363, Sep 2017. [[PDF](#)]
- [ESEM15] K. Gallaba, A. Mesbah, and I. Beschastnikh, "Don't Call Us, We'll Call You: Characterizing Callbacks in JavaScript", In *Proceedings of the International Symposium on Empirical Software Engineering and Measurement (ESEM)*, pp. 247–256, Oct 2015. **🏆 Best Paper Award** [[PDF](#)]

SHORT PAPERS IN INTERNATIONAL CONFERENCES (CORE RANK: A)

- [ICSME19] K. Gallaba, "Improving the Robustness and Efficiency of Continuous Integration and Deployment", In *Proceedings of the International Conference on Software Maintenance and Evolution (ICSME)*, pp. 619–623, Sep 2019. [[PDF](#)]
- [MSR19] D. Abrić, O. E. Clark, M. Caminiti, K. Gallaba, and S. McIntosh, "Can Duplicate Questions on Stack Overflow Benefit the Software Development Community?", In *Proceedings of the 16th International Conference on Mining Software Repositories (MSR), Mining challenge*, pp. 230–234, May 2019. [[PDF](#)]
- [MSR18a] N. Rabbani, M. S. Harvey, S. Saquif, K. Gallaba, and S. McIntosh, "Revisiting 'Programmers' Build Errors' in the Visual Studio Context", In *Proceedings of the 15th International Conference on Mining Software Repositories (MSR), Mining challenge*, pp. 98–101, May 2018. [[PDF](#)]
- [MSR18b] R. Amlekar, A. F. R. Gamboa, K. Gallaba, and S. McIntosh, "Do Software Engineers Use Autocompletion Features Differently Than Other Developers?", In *Proceedings of the 15th International Conference on Mining Software Repositories (MSR), Mining challenge*, pp. 86–89, May 2018. [[PDF](#)]

- [MSR17a] M. Manglaviti, E. Coronado-Montoya, K. Gallaba, and S. McIntosh, "An Empirical Study of the Personnel Overhead of Continuous Integration", In *Proceedings of the 14th International Conference on Mining Software Repositories (MSR)*, Mining challenge, pp. 471–474, May 2017. [[PDF](#)]
- [MSR17b] Y. Khan, Y. Gupta, K. Gallaba, and S. McIntosh, "The Impact of the Adoption of Continuous Integration on Developer Attraction and Retention", In *Proceedings of the 14th International Conference on Mining Software Repositories (MSR)*, Mining challenge, pp. 491–494, May 2017. [[PDF](#)]

ONGOING RESEARCH

- [arXiv] N. Nashid, D. Ding, K. Gallaba, A. E. Hassan, and A. Mesbah, "Beyond Accuracy: Behavioral Dynamics of Agentic Multi-Hunk Repair", Under Review, Nov 2025. [[PDF](#)]
- [arXiv] G. K. Rajbahadur, K. Gallaba, E. Rashno, A. Suriyawongkul, K. Bennet, K. Stewart, and A. E. Hassan, "Building an Open AIBOM Standard in the Wild", Under Review, Oct 2025. [[PDF](#)]
- [arXiv] S. Masoumzadeh, K. Gallaba, D. Lin, and A. E. Hassan, "Towards Reliable Generation of Executable Workflows by Foundation Models", Under Review, Jul 2025. [[PDF](#)]
- [arXiv] K. Gallaba, A. Arabat, D. Lin, M. Sayagh, and A. E. Hassan, "Towards Conversational Development Environments: Using Theory-of-Mind and Multi-Agent Architectures for Requirements Refinement", Under Review, May 2025. [[PDF](#)]

ACADEMIC SERVICE

PROGRAM COMMITTEE MEMBER

Int'l Conference on Software Engineering (ICSE) - SEIP Track	2024, 2025, 2026
Int'l Workshop on Agentic Engineering (AGENT'26)	2026
Int'l Conference on Mining Software Repositories (MSR) - Data and Tools Track	2025, 2026
Int'l Conference on Mining Software Repositories (MSR) - Industry Track	2023, 2025
Int'l Conference on Software Maintenance and Evolution (ICSME) - Industry Track	2024, 2025
Int'l Conference on Software Analysis, Evolution and Reeng. (SANER) - Research Track	2024
Int'l Conference on AI Foundation Models and Software Engineering (FORGE)	2024
Int'l Conference on Mining Software Repositories (MSR) - Junior PC	2023
Int'l Conference on Program Comprehension (ICPC) - Tools Track	2019
Int'l Conference on Object-oriented Programming, Systems, Languages, and Applications (OOPSLA) - Artifact Evaluation Committee	2017

REVIEWER

ACM Transactions on Software Engineering and Methodology (TOSEM)	2024 – Present
Empirical Software Engineering Journal (EMSE)	2021 – Present
IEEE Transactions on Software Engineering (TSE)	2019 – Present
Journal of Systems and Software (JSS)	2019 – Present
Journal of Information and Software Technology (IST)	2018 – Present

CO-REVIEWER

Int'l Conference on Software Analysis, Evolution, and Reengineering (SANER)	2019
Int'l Conference on Mining Software Repositories (MSR)	2018
Canadian Conference on Electrical and Computer Engineering (CCECE)	2018
Int'l Conference on Software Maintenance and Evolution (ICSME)	2017

ORGANIZING COMMITTEE

Int'l Conference on AI-powered Software (AIware) - Proceedings Chair	2024
Int'l Conference on Source Code Analysis and Manipulation (SCAM) - Social Media Co-chair	2021

INVITED EVENTS

RAISE 2025: Requirements engineering for AI-powered Software	May 2025
Invited talk on "Leveraging Foundation Models to synthesize intents" at RAISE workshop co-located with ICSE'25.	
FM+SE Vision 2030	Nov 2023
A forum for industrial and academic experts to discuss advances at the intersection of Software Engineering and Foundation Models, held in Mexico City, Mexico.	
Shonan Meeting No. 152	Dec 2019
on "Release Engineering for Mobile Applications" held in Kanagawa, Japan.	

Shonan Meeting No. 095 Mar 2017
on "Mining Software Repositories: Accomplishments, Challenges and Future Trends" held in Kanagawa, Japan.

MENTORING EXPERIENCE

Undergraduate Students (Co-advised with Dr. Shane McIntosh)

Durham Abric, Oliver Clark, Matthew Caminiti Sep 2018 – Apr 2019
Co-authored Papers: MSR19

Rahul Amlekar, Noam Rabbani, Mike Harvey, Sep 2017 – Apr 2018
Sadnan Saquif, Andrés Felipe Rincón Gamboa
Co-authored Papers: MSR18a, MSR18b

Marco Manglaviti, Eduardo Coronado-Montoya, Yash Gupta, Yusaira Khan Sep 2016 – Apr 2017
Co-authored Papers: MSR17a, MSR17b

OPEN SOURCE CONTRIBUTIONS

Gephi, Open source graph visualization and manipulation software

System Developer/GSoC Student Jan 2011 – May 2011
Developed an automated Maven build to fasten the release process of Gephi. [[Team Profile](#)] [[Details](#)]

Crawljax, a tool for automatically crawling and testing modern web applications

Contributor/Maintainer Nov 2013 – Aug 2014
Fixing bugs, updating dependencies, and other routine maintenance. [[Project](#)]

Other,

Localization Contributor Jan 2008 – Present
Localization of FOSS projects including Ubuntu, Sugar Labs, GNOME and Miro [[Launchpad](#)]

Minor Contributor Feb 2011 – Present
Contributed via patches and pull requests to well-known OSS projects. [[GitHub](#)]

MEMBERSHIPS

Professional Member Association for Computer Machinery (ACM)
Member ACM Special Interest Group on Software Engineering (SIGSOFT)

REFERENCES

Professor Shane McIntosh (Relationship: PhD Thesis Advisor)
Associate Professor and Associate Director of Graduate Studies
David R. Cheriton School of Computer Science, University of Waterloo
Waterloo, ON, Canada N2L 3G1
shane.mcintosh@uwaterloo.ca

Professor Ali Mesbah (Relationship: MSc Thesis Advisor)
Professor of Software Engineering
Department of Electrical and Computer Engineering, University of British Columbia (UBC)
KAIS 4044, 2332 Main Mall, Vancouver, BC, Canada V6T 1Z4
amesbah@ece.ubc.ca

Professor Massimiliano Di Penta
Professor of Computer Science
University of Sannio
Via Traiano, 9 - 82100 Benevento, Italy
dipenta@unisannio.it