Muhammad Asaduzzaman

Assistant Professor

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Highlights

- Research on Mining Software Repositories, Empirical Software Engineering, and Recommendation Systems in Software Engineering.
- Research is supported by NSERC Discovery Grant and other agencies.
- Developed and taught graduate and undergraduate level courses.
- Supervision of graduate thesis and project students.
- Collaboration with researchers in other universities and Interdisciplinary collaboration with researchers.

Research Interests

My research facilitates software development activities by mining source code repositories, community question-answering sites, and online tutorials. To this end, I leverage static analysis, data mining, machine learning, and natural language processing to develop solutions. I believe that careful investigation and analysis are the keys to developing state-of-the-art tools and techniques. Thus, my research is a blend of empirical theories and their associated tools to support software development tasks and to increase the productivity of developers.

Chronological Account of Career

Appt Dates	**Position**	**Employer**
Jul 2023- To date	Tenure-track Assistant Professor	School of Computer Science University of Windsor, ON, Canada
Jan 2021- Jun 2023	Tenure-track Assistant Professor	Department of Computer Science Lakehead University, ON, Canada
2018-2020	Postdoctoral Fellow	School of Computing Queens University, ON, Canada
2010-2017	Graduate Research Assistant	Department of Computer Science College of Arts and Science University of Saskatchewan, SK, Canada
2010-2017	Graduate Teaching Assistant	Department of Computer Science College of Arts and Science University of Saskatchewan, SK, Canada
2008-2009	Lecturer	Computer Science and Engineering Discipline Mawlana Bhashani Science and Technology University, Bangladesh
2006-2007	Lecturer	Department of Computer Science Stamford University Bangladesh Bangladesh

Research Grants Received

Year	**Grantee**	**Agency**	Title	**Amount**
2022	Muhammad Asaduzzaman (principal investigator)	NSERC (Discovery Grant)	Supporting Reusability of Online Code Examples	125,000
2022	Muhammad Asaduzzaman (principal investigator)	NSERC (Discovery Launch Supplement)	Supporting Reusability of Online Code Examples	12,500
2022	Muhammad Asaduzzaman (principal investigator)	Lakehead University (SRC Research Development Fund)	Learning Mapping of Library APIs across Different Languages	7,000
2021	Muhammad Asaduzzaman (co-investigator)	Lakehead University (Year of Climate Action fund)	Benchmarking Climate Change Policies across Canadian School Boards	5,000

Publications

A. Articles Published in Refereed Conferences/Journals

1. K. Yao, G. A. Olivia, A. E. Hassan, **M. Asaduzzaman**, A. J. Malton, and A. Walenstein, "Finding associations between natural and computer languages: A case-study of bilingual LDA applied to the bleeping computer forum posts", Journal of Systems and Software, Volume 201, 2023.
2. K. W. Nafi, **M. Asaduzzaman**, B. Roy, C. K. Roy, and K. Schneider, Mining Software Information Sites to Recommend Cross-Language Analogical Libraries, in Proc. of the 29th IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER), pp. 913-924, 2022 (36.2% acceptance rate).
3. A. Bhatia, S. Wang, **M. Asaduzzaman**, and A. E. Hassan. "A Study of Bug Management Using the Stack Exchange Question and Answering Platform". published in IEEE Transaction of Software Engineering Journal (TSE), pp. 1-1, 2020.
4. C. M. K. Saifullah, **M. Asaduzzaman**, C. K. Roy. "Exploring Type Inference Techniques of Dynamically Typed Languages". in Proc. of the IEEE 27th International Conference on Software Analysis, Evolution and Reengineering (SANER), pp. 70-80, 2020 (21.1% acceptance rate).
5. C. M. K. Saifullah, **M. Asaduzzaman**, and C. K. Roy. "Learning from Examples to Find Fully Qualified Names of API Elements in Code Snippets", in Proc. of the 34th IEEE/ACM International Conference on Automated Software Engineering (ASE 2019), pp. 243-254, 2019 (22.2% acceptance rate).
6. M. Ahasanuzzaman, **M. Asaduzzaman**, C. K. Roy, and K. A. Schneider. CAPS: A Supervised Technique for Classifying Stack Overflow Posts Concerning API Issues, Empirical Software Engineering Journal (EMSE), pp. 1493-1532, 2019.
7. M. Ahasanuzzaman, **M. Asaduzzaman**, C. K. Roy, and K. A. Schneider, "Classifying Stack Overflow Posts on API Issues", in Proc. of the 25th IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER), pp. 244-254, 2018 (27% acceptance rate).
8. **M. Asaduzzaman**, C. K. Roy, K. A. Schneider, and D. Hou, "Recommending Framework Extension Examples", in Proc. of the 33rd International Conference on Software Maintenance and Evolution (ICSME), pp. 456-466, 2017 (27.8% acceptance rate).
9. **M. Asaduzzaman**, C. K. Roy, K. A. Schneider, and D. Hou, "A Simple, Efficient, Context-sensitive Approach for Code Completion", Journal of Software: Evolution and Process, pp. 512-541, 2016.
10. **M. Asaduzzaman**, C. K. Roy, S. Monir, K. A. Schneider, "Exploring API Method Parameter Recommendations", in Proc. of the 31st International Conference on Software Maintenance and Evolution (ICSME), pp. 271-280, 2015 (22% acceptance rate).
11. **M. Asaduzzaman**, C. K. Roy, K. A. Schneider, Daqing Hou, "CSCC: Simple, Efficient, Context Sensitive Code Completion", in Proc. of the 30th International Conference on Software Maintenance and Evolution (ICSME), pp. 71-80, 2014 (19% acceptance rate).
12. **M. Asaduzzaman**, C. K. Roy, K. A. Schneider, M. D. Penta, "LHDiff: A Language-Independent Hybrid Approach for Tracking Source Code Lines", in Proc. of the 29th International Conference on Software maintenance (ICSM 2013), pp. 230-239, 2013 (22% acceptance rate).
13. M. F. Zibran, R. K. Saha, **M. Asaduzzaman**, and C. K. Roy, "Analyzing and Forecasting Near-miss Clones in Evolving Software: An Empirical Study", in Proc. of the 16th IEEE International Conference on Engineering of Complex Computer Systems (ICECCS), pp. 295-304, 2011.
14. R. K. Saha, **M. Asaduzzaman**, M. F. Zibran, C. K. Roy, and K. A. Schneider, "Evaluating Code Clone Genealogies at Release Level: An Empirical Study", in Proc. of the 10th IEEE International Conference on Source Code Analysis and Manipulation (SCAM), pp. 87-96, 2010 (38.6% acceptance rate).

B. Refereed Short Conference/ Tool Demonstration Papers

1. C. M. K. Saifullah, **M. Asaduzzaman** and C. K. Roy, "COSTER: A Tool for Finding Fully Qualified Names of API Elements in Online Code Snippets", in Proc. of the IEEE/ACM

43rd International Conference on Software Engineering: Companion Proceedings (ICSE-Companion), pp. 73-76, 2021 (37% acceptance rate).

2. **M. Asaduzzaman**, C. K. Roy, K. A. Schneider, and D. Hou, "FEMIR: A Tool for Recommending Framework Extension Examples", in Proc. of the 32nd IEEE/ACM International Conference on Automated Software Engineering (ASE), pp. 967-972, 2017 (63% acceptance rate).
3. **M. Asaduzzaman**, **M. Ahasanuzzaman**, C. K. Roy, K. A. Schneider, "How Developers Use Exception Handling in Java?", in Proc. of the 13th International Conference on Mining Software Repositories (MSR), pp. 516-519, 2016 (42% acceptance rate).
4. **M. Asaduzzaman**, C. K. Roy, K. A. Schneider, "PARC: Recommending API Methods Parameters", in Proc. of the of the 31st International Conference on Software Maintenance and Evolution (ICSME), pp. 330-332, 2015.
5. **M. Asaduzzaman**, C. K. Roy, K. A. Schneider, Daqing Hou, "Context-sensitive Code Completion Tool for Better API Usability", in Proc. of the 30th International Conference on Software maintenance and Evolution (ICSME), pp. 621-624, 2014 (52% acceptance rate).
6. **M. Asaduzzaman**, C. K. Roy, K. A. Schneider, M. D. Penta, "Tracking Source Code Lines to Support Software Maintenance Activities", in Proc. of the 29th International Conference on Software maintenance (ICSM), pp. 484-487, 2013 (54% acceptance rate).
7. **M. Asaduzzaman**, A. S. Mashiyat, C. K. Roy, and K. A. Schneider, "Answering Questions about Unanswered Questions of Stack Overow", in Proc. of the 10th Working Conference on Mining Software Repositories (MSR), pp. 97-100, 2013 (40% acceptance rate).
8. **M. Asaduzzaman**, M. Bullock, C. K. Roy, and K. A. Schneider, "Bug Introducing Changes: A Study with Android", in Proc. of the 9th Working Conference on Mining Software Repositories (MSR), pp. 116-119, 2012 (35% acceptance rate).
9. **M. Asaduzzaman**, C. K. Roy, and K. A. Schneider, "VisCad: Flexible Code Clone Analysis Support For NiCad", in Proc. of the Tool Demo Track of the 5th International Workshop on Software Clones (IWSC), pp. 77-78, 2011.

Menuscript in Preparation

1. An Exploratory Study of the Differences Between Bug Reports and Feature Requests Using the Stack Exchange Question and Answering Platform
2. Studying the Relation between Community Wiki Posts and User Participation in Stack Overflow
3. Mining Migrated Questions in Stack Overflow
4. Clone-based Method Completion

Software

1. **COSTER: A Tool for Identifying Fully Qualified Names of API Elements in Code Examples**. The tools is available as an Eclipse plugin and as a command line utility.
2. **FEMIR: Recommending Framework Extension Examples**. An Eclipse plugin that identifies patterns of extending software frameworks, visualizes the result and links patters to code examples.
3. **PARC: Recommending API Methods Parameters.** The tool is available as an Eclipse plugin and supports automatic completion of method parameters.
4. **CSCC: Simple, Efficient, Context Sensitive Method Call Completion**. The tool is available as an Eclipse plugin.
5. **LHDiff: A Language-Independent Tool for Tracking Source Code Lines**. The tool has been published as an open source software.
6. **VisCad: A Support Environment for Code Clone Analysis**. The tool supports reviewing, filtering and visualization of clone detection results. It is available as an open source software.

Thesis or projects supervised

Course and Number	Name of Student (s)	Title of Thesis/Project	Status
M.Sc. in CS	Md. Anaytul Islam	Exploring Executability of R-Markdown Files	Ongoing
M.Sc. in CS	Subrata Das	Name-based Bug Detection	Completed
COMP-9800-GB	Numan Imran and Het Kiritbhai Solanki	Recommending Third-Party Libraries	Completed
COMP-9800-GB	Bithy Das and Khyati Nareshkumar Patel	Resolving Dependency Conflics in Python Programs	Ongoing
COMP-5800-YD	Girijesh Singh and Palak Patel	EEG Signal Anonymization: Preserving Identity and Utility using Deep Learning-based Autoencoder Architecture	Completed
COMP-5800-YD	Venkata Praveen Kumar Kandimalla and Kartik Atul Nerkar	Classifying GitHub Issue Types	Completed
COMP-5800-YD	Md Ariful Islam and Md. Aminul Islam	A Study on Context-Aware Query Reformulation in IR-Based Bug Localization	Completed
COMP-5800-YD	Junjiao Dou, Abdul Sattar Raja, Manoj Sangita and Arpit Trikha	An Analysis of Stack Overflow Links in Github	Completed
COMP-5800-YD	Harmee Patel and Shivam Pande	Evaluating the Effectiveness of the BART Model in Correcting GitHub typos	Completed
COMP-5800-GDF	Diamond Mohanty and Nihar Hitendrakumar Joshi	Learning to Edit Stack Overflow Posts	Completed
COMP-5800-GDF	Venkata Naga Akshita Atmuri	Analyzing Reopened Questions in Stack Overflow	Completed
COMP-5800-GDF	Md. Haider Ali and Ankurita Bhattacharjee	Finding Analogical APIs across Different Libraries	Completed
COMP-5800-GDF	Vishnu Vardhan Kotla and Manusree Gurijala	Developing Software Specific Thesaurus	Completed
COMP-5800-GDF	Mitushi Ananya	Information Retrieval-based Bug Localization	Completed
COMP-5800-GDF	Mahesh Kumar Muddunuru	Predicting Deleted Questions in Stack Overflow	Completed
COMP-5800-GDF	Lipsa Laxmidas Khant and Nisarg Nipulbhai Shah	Identifying Environmental Dependencies for Python Code Snippets	Completed
COMP-9800-GF	Madhvikaben Bhatt and Leonard Michael Gomes Dip	Understanding Deleted Comments in Stack Overflow	Completed
COMP-9800-GF	Nilam Bhosale and Raj Manojkumar Salla	Identifying API methods in Stack Overflow Posts	Completed

Professional Activities

A. Service to University

1. Scholarship Officer, Department of Computer Science, Lakehead University (February 2022–Jun, 2023)
2. Chair Nomination Committee, Department of Computer Science, Lakehead University (February 2023–March 2023)
3. Faculty Hiring Committee, Department of Computer Science, Lakehead University (September 2022–December 2022)
4. Member, Senate Undergraduate Studies Committee, Lakehead University (April 11, 2022–December 30, 2022)

B. Program Committee Member

1. Member of the program committee, IEEE International Working Conference on Source Code Analysis and Manipulation (SCAM, 2022), held at Limassol, Cyprus.
2. Member of the evaluation committee for the Artifact Evaluation Track, ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE, 2022), held at Singapore.
3. Member of the program committee for the ACM Studen Research Competition Track, The 15th Innovations in Software Engineering Conference (ISEC 2022) held at DA-IICT Gandhinagar, India.

4. Member of the program committee for the Artifact Evaluation Track, ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE, 2021), held at Athens, Greece.
5. Member of the program committee for the Tool Demo Track, IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER, 2019), held at Hangzhou, China.

C. Journal Reviewer

1. Reviewer, Neurocomputing (2021-2023)
2. Reviewer, Journal of Software: Evolution and Process (2022-2023)
3. IEEE Transactions on Software Engineering (2020-2022)
4. Empirical Software Engineering (2018-2022)
5. Empirical Knowledge and Information System (2016)
6. International Journal of Software Engineering and Knowledge Engineering (2016)

D. Co-Reviewer

1. The 28th Annual International Conference on Computer Science and Software Engineering (CASCON), 2018.
2. The 40th International Conference on Software Engineering (ICSE), 2018.

E. Others

1. Session Chair, Consortium for Software Engineering Research (CSER) Fall Meeting, University of Alberta, Canada, 2016.
2. Publicity and Web chair, 9th International Workshop on Software Clones, Montreal, Canada, 2015.

Teaching Experience

Coures Name	Location	Instructor	TA
COMP 5413: Special Topics in Software Engineering, (Winter 2023, Winter 2022, Summer 2021, Winter 2021)	Department of Computer Science, Lakehead University, Thunder Bay, Canada	✓	
COMP 2412: Data Structures, (Fall 2021, Fall 2022)	Department of Computer Science, Lakehead University, Thunder Bay, Canada	✓	
COMP 3415: Software Engineering, (Fall 2021, Winter 2023)	Department of Computer Science, Lakehead University, Thunder Bay, Canada	✓	
CISC 880: Mining Software Engineering Data, (Fall 2018)	School of Computing, Queen's University, Kingston, Canada		✓
CMPT 120: Digital Document Processing, (Winter Term 2, 2016)	Department of Computer Science, University of Saskatchewan, Canada.	✓	
CMPT 111: Introduction to Computer Science and Programming, CMPT 280: Intermediate Data Structures and Algorithms, CMPT 370: Intermediate Software Engineering, CMPT 371: Software Management	Department of Computer Science, University of Saskatchewan, Canada.		✓
Object Oriented Programming, Data Structure, Software Engineering, Networking, Computer Graphics, Database Systems (January 2008-Dec 2009)	Computer Science and Engineering Discipline, Mawlana Bhashani Science and Technology University, Bangladesh	✓	
Programming Fundamentals, Data Structure, Algorithms, Object Oriented Analysis and Design, Computer Graphics (June 2006-December 2007)	Department of Computer Science, Stamford University Bangladesh, Dhaka, Bangladesh	✓	
Cisco Networking Academy Program (April 2007-Dec 2009)	Stamford University Bangladesh, Dhaka, Bangladesh	✓	

Awards & Achievements

1. Postgraduate Affiliate, Vector Institute, (March 31, 2020 to March 31, 2021)
2. NSERC Postdoctoral Fellowship (March, 2018-February, 2020)
3. Teacher Scholar Doctoral Fellowship, 2015-2016, University of Saskatchewan, Canada.
4. College of Graduate Studies and Research Travel Award, for attending ICSME 2014. Victoria, British Columbia, Canada, 2014.

5. Department of Computer Science Scholarship, Department of Computer Science, University of Saskatchewan, Canada, 2014.
6. Best Paper Nomination Award, 30th International Conference on Software maintenance and Evolution (ICSME 2014).
7. College of Graduate Studies and Research Travel Award, for attending MSR 2013 and ICPC 2013. San Francisco, USA, April 2013.
8. Graduate Teaching Fellowship Award, Department of Computer Science, 2013 .
9. College of Graduate Studies and Research Travel Award, for attending fifth International Workshop on Software Clones (IWSC). Hawaii, USA, May 2011.
10. Faculty Scholarship and Graduate Teaching Fellowship Award, Department of Computer Science, University of Saskatchewan, Canada (2010-2011).
11. Second place recipient (group level), programming contest, University of Saskatchewan, Canada (October 2011).
12. Second place recipient (group level), programming contest, University of Saskatchewan, Canada (March 2011).

Education

Ph.D. In Computer Science (January, 2018), University of Saskatchewan, Canada
Thesis: Context-Sensitive Code Completion
External: Dr. Tien N. Nguyen
Computer Science Department, The University of Texas at Dallas.
Advisors: Dr. Chanchal K. Roy and Dr. Kevin A. Schneider

M. Sc. In Computer Science (January, 2012), University of Saskatchewan, Canada
Thesis: Visualization and Analysis of Software Clones
Advisors: Dr. Chanchal K. Roy and Dr. Kevin A. Schneider

B. Sc. In Computer Science and Engineering (March, 2006)
Department of Computer Science and Engineering
Khulna University, Khulna, Bangladesh.
Thesis: Elliptic Curve Cryptography Over Composite Field
Advisor: Dr. Md. Rafiqul Islam

Community Activities

1. President, Bangladeshi Students Association at the University of Saskatchewan (BSAUS), Canada (2015-2016).
2. President, Computer Science Graduate Course Council (CSGCC), Department of Computer Science, University of Saskatchewan, Canada (2013-2014).
3. GSA Representative, Computer Science Graduate Course Council (CSGCC), Department of Computer Science, University of Saskatchewan, Canada (2012-2013).
4. VP Social, Computer Science Graduate Course Council (CSGCC), Department of Computer Science, University of Saskatchewan, Canada (2011-2012).
5. Member, Ad-hoc committee, Bangladeshi Student Association, University of Saskatchewan, 2012.
6. Volunteer, Folkfest at Bangladesh Pavilion, Saskatchewan, Saskatoon, Canada, 2011

References

[1]	Ahmed E. Hassan Professor, IEEE Fellow School of Computing Queens University, Canada Website: http://research.cs.queensu.ca/~ahmed/home/	Phone: 1-613-533-3337 Email: ahmed@cs.queensu.ca
[2]	Chanchal K. Roy Professor Department of Computer Science University of Saskatchewan, Saskatoon, Canada Website: https://www.cs.usask.ca/~croy/	Phone: +1-306-966-4163 Email: croy@cs.usask.ca
[3]	Daqing Hou Professor Director, Software Engineering Program Electrical and Computer Engineering Department Clarkson University, Potsdam, New York Website: http://people.clarkson.edu/~dhou/	Email: dhou@clarkson.edu