

Foyzul Hassan
Assistant Professor
Department of Computer & Information Science
University of Michigan-Dearborn

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RESEARCH INTERESTS My main interest is improving software productivity. Some specific areas of interest to me are: continuous integration, software build processes, script code analysis, program repair and fault localization, software engineering tools for machine learning (SE4ML), and security analysis for development tools.

EDUCATION **University of Texas at San Antonio, USA**

PhD in Computer Science, 2020
MSc in Computer Science, 2019

- Dissertation Topic: Tackling Build Failures in Continuous Integration.
- Advisor: Xiaoyin Wang

United International University, Bangladesh

MSc in Computer Science & Engineering, 2012

- Dissertation Topic: Neural Network based Context Sensitive Triphone HMM for Bangla ASR.
- Advisor: Muhammad Nurul Huda

Military Institute of Science and Technology, Bangladesh

BSc in Computer Science & Engineering, 2007

- Dissertation Topic: Learning heuristic estimation for A* search using back propagation neural network.
- Advisor: Chowdhury Mofizur Rahman

PROFESSIONAL EXPERIENCE

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| Sep, 2020 - till date | Assistant Professor. Department of Computer & Information Science, University of Michigan-Dearborn. |
| Aug, 2015 - Aug, 2020 | Research Assistant. Advisor: Xiaoyin Wang, Department of Computer Science, University of Texas at San Antonio. |
| 2019, May - Aug. 2019 | Research Intern. Microsoft Research, Research in Software Engineering (RiSE) Group. Mentor: Nachi Nagappan and Tom Zimmermann Focus: Web search behavior of software engineers. (Patent pending) |
| 2014 - 2015 | QA Manager. Kona Software Lab Ltd, Dhaka, Bangladesh. |
| 2008 - 2014 | QA Lead, QA Engineer. Enosis Solutions, Dhaka, Bangladesh. |

PUBLICATIONS

Foyzul Hassan, Na Meng, Xiaoyin Wang, *UniLoc: Unified Fault Localization of Continuous Integration Failures*, Accepted in the ACM Transactions on Software Engineering and Methodology (TOSEM), Impact factor 3.685, Q1 Journal (SJI Ranking-2021), 2023.

Md Abul Kalam Azad*, Nafees Iqbal*, **Foyzul Hassan** and Probir Roy, *An Empirical Study of High Performance Computing (HPC) Performance Bugs*, Accepted in the International Conference on Mining Software Repositories (MSR), 2023. [* Both Students Contributed Equally]

Dhia Elhaq Rzig, **Foyzul Hassan** and Marouane Kessentini, *An Empirical Study on ML DevOps Adoption Trends, Efforts, and Benefits Analysis*, Information and Software Technology (IST), Impact factor 3.862, Q1 Journal (SJI Ranking-2021), 2022.

Dhia Elhaq Rzig, **Foyzul Hassan**, Chetan Bansal and Nachiappan Nagappan, *Characterizing the usage of CI tools in ML projects*, Accepted in 16th ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM), 2022.

Xue Qin and **Foyzul Hassan**, *DyTRec: A Dynamic Testing Recommendation tool for Virtual Reality Software*, First International Workshop on Virtual and Augmented Reality Software Engineering, co-located with the 37th IEEE/ACM International Conference on Automated Software Engineering (ASE), 2022.

Emna Ksontini, Marouane Kessentini, Thiago do Nascimento Ferreira, **Foyzul Hassan**, *Refactorings and Technical Debt in Docker Projects: An Empirical Study*, Accepted in International Conference on Automated Software Engineering (ASE), 2021.

Fariha Nusrat, **Foyzul Hassan**, Hao Zhong, Xiaoyin Wang, *How Developers Optimize Virtual Reality Applications: A Study of Optimization Commits in Open Source Unity Projects*, Accepted in 43rd International Conference on Software Engineering (ICSE 2021).

Foyzul Hassan, Chetan Bansal, Nachiappan Nagappan, Thomas Zimmermann, Ahmed Hassan Awadallah, *Exceptions in the Wild: A Large-Scale Study using Search Logs*, in submission at The ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM 2020).

Lingchao Chen, **Foyzul Hassan**, Xiaoyin Wang, Lingming Zhang, *Taming Behavioral Backward Incompatibilities via Cross-Project Testing and Analysis*, Accepted in 42nd International Conference on Software Engineering (ICSE 2020).

Foyzul Hassan, *Tackling Build Failures in Continuous Integration*, Accepted in International Conference on Automated Software Engineering (ASE 2019), Doctoral Symposium.

Foyzul Hassan, Rodney Rodriguez, Xiaoyin Wang, *RUDSEA: recommending updates of Dockerfiles via software environment analysis*, [New Idea Paper], Proceedings of the 33rd IEEE/ACM International Conference on Automated Software Engineering (ASE 2018), Pages 796-801.

Foyzul Hassan, Xiaoyin Wang, *HireBuild: an automatic approach to history-driven repair of build scripts*, Proceedings of the 40th International Conference on Software Engineering (ICSE 2018), Pages 1078-1089.

Foyzul Hassan, Shaikh Mostafa, Edmund SL Lam, Xiaoyin Wang, *Automatic building of java projects in software repositories: A study on feasibility and challenges*, Proceedings of the 11th ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM 2017), Pages 38-47.

Foyzul Hassan, Xiaoyin Wang, *Change-aware build prediction model for stall avoidance in continuous integration*, [Short Paper] Proceedings of the 11th ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM 2017), Pages 157-162.

Foyzul Hassan, Xiaoyin Wang, *Mining readme files to support automatic building of java projects in software repositories*, [Poster Track] Proceedings of the 39th International Conference on Software Engineering Companion (ICSE 2017), Pages 277-279.

Foyzul Hassan, Mohammed Rokibul Alam Kotwal, Mohammad Nurul Huda, *Bangla Phonetic Feature Table Construction for Automatic Speech Recognition*, Proceedings of 16th Int'l Conf. Computer and Information Technology (ICCIT 2013), Pages 51-55.

Mohammed Rokibul Alam Kotwal, **Foyzul Hassan**, Mohammad Nurul Huda, *Speech Feature Evaluation for Bangla Automatic Speech Recognition*, [Book Chapter], Technical Challenges and Design Issues in Bangla Language Processing, IGI Global, Pages 169-208.

Foyzul Hassan, Mohammad Saiful Alam Khan, Mohammed Rokibul Alam Kotwal, Mohammad Nurul Huda, *Gender independent Bangla automatic speech recognition*, Proceedings of Int'l Conf. on Informatics, Electronics & Vision (ICIEV 2012), Pages 144-148.

Foyzul Hassan, Mohammed Rokibul Alam Kotwal, Mohammad Nurul Huda, *MLN-based Bangla ASR using context sensitive triphone HMM*, International Journal of Speech Technology (2011), Pages 183-191.

Foyzul Hassan, Mohammed Rokibul Alam Kotwal, Mohammad Mahedi Hasan, Ghulam Muhammad, Mohammad Nurul Huda, *Inhibition/Enhancement Network Based ASR using Multiple DPF Extractors.*, Journal of Multimedia (2011), Pages 395-403.

In Submission/Preparation

Dhia Elhaq Rzig, Nafees Iqbal, Isabella Attisano, Xue Qin, **Foyzul Hassan**, *Virtual Reality (VR) Automated Testing in the Wild: a Case Study on Unity-Based VR Applications*, in submission for the ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA), 2023.

Jason Hogan, Aaron Salo, Dhia Elhaq Rzig, **Foyzul Hassan**, Bruce Maxim, *Analysis and Detection of Performance Bugs in Unreal Engine-Based Extended Reality Applications*, in preparation for the ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM), 2023.

Patent Submission

Foyzul Hassan, Chetan Bansal, Thomas Michael Josef Zimmermann, Nachiappan Nagappan, Ahmed Awadallah, *Automated Exception Featurization and Search*, US Patent App. 16/659,174

2020), Virtual Presentation.

Tackling Build Failures in Continuous Integration, at the 33rd IEEE/ACM International Conference on Automated Software Engineering (ASE 2018), San Diego, USA.

HireBuild: an automatic approach to history-driven repair of build scripts, at the 40th International Conference on Software Engineering (ICSE 2018), Gothenburg, Sweden.

Automatic building of java projects in software repositories: A study on feasibility and challenges, at the 11th ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM 2017), Toronto, Canada.

Change-aware build prediction model for stall avoidance in continuous integration, at the 11th ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM 2017), Toronto, Canada.

An Inhibition/Enhancement network for noise robust ASR, at the 13th Int'l Conf. on Computer and Information Technology (ICCIT 2010), Dhaka, Bangladesh.

OTHER TALKS

How Developers Optimize Virtual Reality Applications: A Study of Optimization Commits in Open Source Unity Projects, SE Seminar Invitation, University of Delaware. (April 2022)

Improving the Stability and Efficiency of Continuous Integration, CIS Department Seminar, Minnesota State University, Mankato. (October 2021)

Improving the Stability and Efficiency of Continuous Integration, CIS Department Seminar, Minnesota State University, Mankato. (October 2021)

Improving the Stability and Efficiency of Continuous Integration, CIS Department Seminar, University of Michigan-Dearborn. (October 2020)

Improving the Stability and Efficiency of Continuous Integration, CIS Department Seminar, University of Michigan-Dearborn. (October 2020)

Improving the Stability and Efficiency of Continuous Integration, Invited talk, New Mexico State University. (February 2020)

Improving the Stability and Efficiency of Continuous Integration, Invited talk, University of Maryland, Baltimore County. (February 2020)

Build Prediction Model in Continuous Integration to Avoid Integration Delay, Graduate Research Seminar, University of Texas at San Antonio. (March 2017)

TEACHING & MENTORING EXPERIENCE

Course Taught

Winter 2023 Instructor, CIS 565: Software Quality Assurance.
Instructor, CIS 376: Software Engineering II.
University of Michigan-Dearborn

Fall 2022 Instructor, CIS 580: Data Analytics in Software Engineering.
Instructor, CIS 566: Software Architecture and Design Patterns.
University of Michigan-Dearborn

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| Winter | 2022 | Instructor, CIS 565: Software Quality Assurance. University of Michigan-Dearborn |
| Fall | 2021 | Instructor, CIS 580: Data Analytics in Software Engineering. University of Michigan-Dearborn |
| Winter | 2021 | Instructor, CIS 376: Software Engineering II. University of Michigan-Dearborn |
| Fall | 2020 | Instructor, CIS 376: Software Engineering II. University of Michigan-Dearborn |
| Spring | 2019 | Instructor of Record, CS 3773: Software Engineering. University of Texas at San Antonio (UTSA) |
| Fall | 2018 | Instructor of Record, CS 1063: Introduction to Programming I. UTSA. |
| Fall | 2019 | Teaching Assistant, Software Engineering, UTSA. |
| Summer | 2018 | Teaching Assistant, Software Validation and Quality Assurance, UTSA. |
| Spring | 2018 | Teaching Assistant, Software Engineering, UTSA. |

Mentoring University of Michigan-Dearborn

Graduate Students

Dhia Elhaq Rzig, PhD Student, Sept.2020–
 Nafees Iqbal, PhD Student, Jan.2022–
 Alaa Houerbi, Masters Student, May.2022–
 Nour Haj Salem, Masters Student, Jan.2023–
 Mit Patel, Masters Student, Jan.2022-Apr.2022
 Moetez Skouri, Masters Student, Jan.2022-Apr.2022

Undergraduate Students

Nico Bokhari, Jan.2023–
 Alexis Tucker, Sep.2022-Dec.2022
 Sherry Robbins, May.2021-Aug.2021
 Jason Hogan, (Co-Adviser: Dr. Bruce Maxim), May.2021-
 Dec.2021
 Aaron Salo, (Co-Adviser: Dr. Bruce Maxim), May.2021-Dec.2021

Thesis Committee Member

Asif Kamal Turzo, Empirical Study on Code Review. (Wayne State University, PhD External Dissertation Committee Member)
 Kapotaksha Das, Multimodal Detection of Driver’s Drowsiness and Distraction. (PhD Candidacy Exam: Nov 18th, 2022)
 Rafi Almhana, Intelligent Software Bugs Localization, Triage and Prioritization. (PhD Proposal Date: Oct 8th, 2020)
 Jeffrey Yackley, Improving Refactoring Recommendations via Simultaneous Testing, Dependency Analysis, and Fixing Multi-level Quality Issues. (PhD Proposal Date: Oct 9th, 2020)

RESEARCH
GRANTS

Funded Proposals

1. Sole PI, NSF CRII: SHF: Assessing and Profiling Continuous Integration for Machine Learning Applications (NSF-2152819), \$174,290, May. 2022 to April. 2024.
2. PI, Intelligent Composing, Scheduling and Monitoring of Software Containers for Cyber-Physical Systems, \$10,000, UM-Dearborn DAIR Internal Grant, 2021-22.
3. PI, Analyze and Detect Performance Bottlenecks in Virtual Reality Applications, \$3200, UM-Dearborn Undergraduate Research Grant for Summer 2021.

Pending Proposals

1. PI, Ford Alliance, Change Impact Analysis for AUTOSAR Meta-Model and Interface Changes for Faster and Safer Change Integration.
2. PI, REU Supplement: CRII: SHF: Assessing and Profiling Continuous Integration for Machine Learning Applications.

Declined Proposals

1. Co-PI, NSF: Collaborative Research: CCRI: New: A Software Refactoring Community Infrastructure. Lead PI: Dr. Marouane Kessentini.
2. Senior Personnel, NSF: IUCRC Planning Grant University of Michigan-Dearborn: Center for Pervasive Personalized Intelligence Center, PI: Dr. Marouane Kessentini, Co-PI: Dr. Wencong Su.
3. Co-PI, NSF: REU Site: Research Experience for Undergraduates in AI Engineering, PI: Dr. Marouane Kessentini.
4. PI, Epic Mega Grant, Analyze and Detect Performance Bottlenecks in Unreal Engine-Based VR/AR Applications.
5. PI, UM-Dearborn - UM-Flint Collaborative Research Grants, Test Case Generation for Virtual Reality Systems by Test Case Transplantation.

HONORS AND
AWARDS

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| 2019 | NSF Travel Award for ASE, NSF |
| 2019 | UTSA CS Outstanding Achievement Award for Research, UTSA |
| 2018 | NSF Travel Award for ICSE, NSF |
| 2018 | ACM SigSoft CAPS Award for ICSE, ACM (Declined) |
| 2018 | Graduate Student Professional Development Award, UTSA |
| 2017 | ESEM Travel Grant, UTSA |
| 2017 | Alvarez Grad Fellowship, UTSA |
| 2015 | Full Tuition Award, UTSA |
| 2012 | Summa Cum Laude, UIU |
| 2011 | MSCSE Merit Award, UIU |

TECHNICAL
SKILLS

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| Programming Languages | Java, C/C++, C#.NET, MFC, Python |
| Scripting Languages | Shell Script, Perl |
| Mathematical Tools | Matlab, NumPy |
| DataBase | Oracle 9i, MySql, MSSQL, Azure Cosmos DB |
| Tools & Framework | J2EE 2.0, Spring, Hibernate, Weka, OpenNLP, Pandas, QTP, LoadRunner, JMeter, Selenium, Valgrind, JIRA, Redmine, SVN, Git |

SERVICES

- PC Member, TechDebt 2023
- PC Member, SANER 2023
- PC Member, MSR 2023
- Tutorials-Co-Chair, ASE 2022
- PC Member, SANER 2022
- PC Member, MSR 2022
- PC Member, SANER 2021
- PC Member, SER&IP@ICSE 2021
- Session Chair, Evolution and Reengineering (SANER2021).
- Reviewer, IEEE Transactions on Software Engineering (TSE)
- Reviewer, International Journal on Software Testing, Verification and Reliability (STVR)
- Reviewer, International Journal on Empirical Software Engineering (EMSE)
- SubReviewer, Research track, ASE 2019
- SubReviewer, Research track, ISSTA 2019
- Student volunteer, ICSE 2018
- SubReviewer, Research track, SEKE 2017
- SubReviewer, Research track, SEKE 2016

Department Services

- Review Committee for Eric Charnesky's 2nd Major Review (September, 2022–)
- Undergraduate ABET and Assessment Committee (September, 2022–)
- MS-SWE Program Committee (September, 2020–)
- Research Committee (September, 2020–)
- Computing Facilities Committee (September, 2020–2021)

OTHER ACTIVITIES

- President of Bangladesh Student Association(BSA) UTSA during 2016-2017.
- Mentor San Antonio Youth Code Jam 2015.
- Member, IEEE, ACM, ACM SIGSOFT.