Abdul Ali Bangash

Postdoctoral Fellow at Queen's University
133 Princess St, Kingston, ON K7L 1A8, Canada
https://abdulali.github.io nu.abdulali@gmail.com

CURRENT STATUS

Queen's University, Kingston, CA Jul 2023 - Current
Postdoctoral Researcher at SAIL lab
- Hosts: Dr. Ahmed E. Hassan and Dr. Bram Adams
- Achievement: One of the six selected candidates who have been awarded the esteemed "Vice-Principal Research (VPR) Postdoctoral Fund" `https://www.queensu.ca/vpr/funding/internal/opportunities-funds/postdoctoral`.

EDUCATION

University of Alberta, Edmonton, CA Sep 2018 - Jun 2023
PhD in Computer Science
- Advisors: Dr. Abram Hindle and Dr. Karim Ali
- Thesis: Cost-effective Strategies to Develop Energy-Efficient Mobile Applications
- Achievement: PhD Early Achievement Award

FAST National University, Islamabad, PK Sep 2015 - Jul 2017
Masters in Software Engineering
- Advisor: Mirza Omer Beg
- Thesis: A Methodology to Relate Energy Consumption with Program Execution Structure
- Achievement: Silver Medalist

FAST National University, Islamabad, PK Sep 2010 - Jul 2014
Bachelors in Computer Science
- Achievement: Mentioned in the Dean's List of Honor

RESEARCH EXPERIENCE

Queen's University, Kingston, CA Jul 2023 - current
Postdoctoral Fellow
- Investigating the challenges developers face in maintaining their MLOps pipelines.
- Examining the heterogeneous release processes of foundation models on HuggingFace and their interaction with GitHub.
- Augmenting large language models with code history information to improve automated bug fixing.
- Analyzing prompts "in the wild," i.e., those available on GitHub and other open-source platforms.
- Evaluating the presentation methods of foundation model leaderboards and their quality attributes.
- Leveraging natural language information in the continuous integration pipeline to improve the prediction of build failures.

University of Alberta, Edmonton, CA Sep 2018 - Jun 2023
Graduate Research Assistant
- Developed a hardware-based energy measurement framework for iOS apps.
- Utilized genetic search to identify the most optimal Java compiler transformations for runtime improvement and energy savings.
- Created energy-efficient iOS development guidelines for app developers using static analysis and energy profiling.

- Designed an energy estimation framework that eliminates the need for hardware configurations and test-case execution by developers.
- Conducted a conclusion stability survey of previous software defect prediction approaches to highlight the importance of time-aware defect prediction datasets.

FAST National University, Islamabad, PK August 2016 - August 2018
Graduate Research Assistant
- Investigated the significance of test-case execution paths in measuring the energy consumption of Android applications.

INDUSTRIAL EXPERIENCE

Global Rescue LLC from Boston, PK Oct 2014 - Jun 2015
Java EE Developer
- Responsible for front-end and back-end development of Grid system, an enterprise application system built on Java EE.
- Skills and tools: JSF, JBOSS, MySql, EJB, Hibernate, Maven, Ant, JIRA , Mantis, JMS, Restful, JSON, Git, PuTTY, JQuery, CSS.

Spantic Technologies, Islamabad, PK Jun 2014 - Sep 2014
Java EE Developer
- Designed developed and deployed two modules of skip hire management system in Java EE.
- Skills and tools: JSF, EJB, SVN, PostgresSQL, JBOSS.

TEACHING EXPERIENCE

University of Alberta, Edmonton, CA
Graduate Teaching Assistant

CMPUT 301 – Intro to Software Engineering	Fall'18 – Winter'23 (9 terms)
CMPUT 229 – Computer Organization and Architecture I	Winter'20
ECE 720 – Social Network Analysis	Fall'19

FAST National University, Islamabad, PK
Undergraduate Teaching Assistant

EE218 – Assembly Language	Spring'18
EE204 – Computer Architecture	Spring'17
CS310 – Management Information Systems	Fall'16 & Fall'17
CS102 – Introduction to Programming	Summer'15

MENTORING EXPERIENCE

Queen's University, Kingston, CA Jul 2023 - current
Mentoring students as a Postdoc:
- Zhimin Zhao, 3rd year PhD student
  In 2023, we identified the challenges that developers face in an MLOps pipeline. In 2024, we identified the heterogeneous presentations of foundation model leaderboards and the operational issues they possess.
- Yu Shi, 3rd year PhD student
  In 2023-24, we developed a history-based program repair model that works on natural language.
- Adekunle Ajibode, 2nd year PhD student
  In 2023-24, we identified the underlying model versioning conventions on HuggingFace and introduced the best practices for model versioning. In 2024, we are inspecting the developers' relationship between Github and HuggingFace to streamline their deployment processes.
- Anirban Dey, 2nd year Masters student
  In 2023-24, we leveraged large-language models to predict failing builds in a CI/CD pipeline.

- Arshdeep Singh, final-year Undergrad student
  In 2023, We inspected the usecases and the quality of tools that are developed for Software Bill of Materials.

University of Alberta, Edmonton, CA Sep 2018 - Jun 2023

Mentored students as a research assistant:

- Weiji Sun (PhD Student) & Samuel Iwuchukwu (Masters Student)
  Empirically investigated the collaboration among software developers in open-source software.
- Anisha Islam (Masters Student) & Nipuni Tharushika (Masters Student)
  Replicated previous research on the practice of software testing in Java projects on a larger and updated Github dataset.

JOURNAL PUBLICATIONS

[**CV-1**] Zhimin Zao, **Abdul A. Bangash**, Filipe Cogo, Bram Adams, Ahmed E. Hassan. "On the Workflows and Smells of Leaderboard Operations (LBOps): An Exploratory Study of Foundation Model Leaderboards". IEEE Transactions on Software Engineering (TSE), 2024
`https://arxiv.org/abs/2407.04065`
Major Revision Submitted
IEEE TSE '24, ISSN 1939-3520, Impact factor: 6.5

[**CV-2**] Adekunle Ajibode, **Abdul A. Bangash**, Filipe Cogo, Bram Adams, Ahmed E. Hassan. "The Traits and Characteristics of LLM-Releases on HuggingFace: An Exploratory Analysis". Journal of Empirical Software Engineering (EMSE), 2024
`https://arxiv.org/abs/2409.10472`
Under Review
Springer Nature EMSE '24, ISSN 1573-7616, Impact factor: 4.5

[**CV-3**] Jose M. Aragon-Jurado, **Abdul A. Bangash**, Bernabe Dorronsoro, Karim Ali, Abram Hindle, Patricia Ruiz. "Does Faster Mean Greener? Runtime and Energy Trade-offs in iOS Applications with Compiler Optimizations". Journal of Systems and Software (JSS), 2024
Under Review
Elsevier JSS '24, ISSN 1873-1228, Impact factor: 3.7

[**CV-4**] Hareem Sahar, **Abdul A. Bangash**, Denilson Barbosa, Abram Hindle. "IRJIT: A simple, online, information retrieval approach for just-in-time software defect prediction". Journal of Empirical Software Engineering (EMSE), 2024
`https://link.springer.com/article/10.1007/s10664-024-10514-z`
Springer Nature EMSE '24, ISSN 1573-7616, Impact factor: 4.5

[**CV-5**] Zhimin Zao, Yihao Chen, **Abdul A. Bangash**, Bram Adams, Ahmed E. Hassan. "An Empirical Study of Challenges in Machine Learning Asset Management". Journal of Empirical Software Engineering (EMSE), 2024
`https://link.springer.com/article/10.1007/s10664-024-10474-4`
Springer Nature EMSE '24, ISSN 1382-3256, Impact factor: 4.5

[**CV-6**] Ernesto Oreamuno, Rohan Khan, **Abdul A. Bangash**, Bram Adams, Catherine Stinson. "The State of Documentation Practices of Third-party Machine Learning Models and Datasets". IEEE Software, 2024
`https://www.computer.org/csdl/magazine/so/5555/01/10436659/1UyViY2HASk`
IEEESoftware '24, ISSN 0740-7459, Impact factor: 3.3

[**CV-7**] **Abdul A. Bangash**, Hareem Sahar, Abram Hindle, Karim Ali. "On the

Time-Based Conclusion Stability of Cross-Project Defect Prediction Models". Journal of Empirical Software Engineering (EMSE), 2020
https://link.springer.com/article/10.1007/s10664-020-09878-9
Springer Nature EMSE '20, ISSN 1382-3256, Impact factor: 4.5

[**CV-8**] Hareem Sahar, **Abdul A. Bangash**, and Mirza O. Beg. "Towards energy aware object-oriented development of android applications". Journal of Sustainable Computing: Informatics and Systems (SUSCOM), v.21, pp. 28–46, 2019
https://www.sciencedirect.com/science/article/abs/pii/S2210537918302014
Elsevier SUSCOM '19, ISSN 2210-5379, Impact factor: 3.8

CONFERENCE PUBLICATIONS

[**CV-9**] **Abdul A. Bangash**, Kalvin Eng, Qasim Jamal, Karim Ali, and Abram Hindle. "Energy Consumption Estimation of API-usage in Smartphone Apps via Static Analysis". 20th International Conference on Mining Software Repositories, 2023.
https://ieeexplore.ieee.org/document/10174069
IEEE MSR'23, Main Track
Acceptance Rate: 37%
Core Rank: A

[**CV-10**] Anisha Islam, Nipuni Tharushika, **Abdul A. Bangash**, and Abram Hindle. "Evolution of the Practice of Software Testing in Java Projects". 20th International Conference on Mining Software Repositories, 2023.
https://ieeexplore.ieee.org/document/10174167
IEEE MSR'23, Short Paper
Acceptance Rate: 32%
Core Rank: A

[**CV-11**] Weijie Sun, Samuel Iwuchukwu, **Abdul A. Bangash**, and Abram Hindle. "An Empirical Study to Investigate Collaboration Among Developers in Open Source Software (OSS)". 20th International Conference on Mining Software Repositories, 2023.
https://ieeexplore.ieee.org/document/10174100
IEEE MSR '23, Short Paper (Runner-up – Best Paper Award)
Acceptance Rate: 32%
Core Rank: A

[**CV-12**] **Abdul A. Bangash**, Karim Ali, and Abram Hindle. "A Black Box Technique to Reduce Energy Consumption of Android Apps". 44th IEEE/ACM International Conference on Software Engineering, 2022.
https://ieeexplore.ieee.org/document/9793522
IEEE ICSE-NIER'22, Short Paper
Acceptance Rate: 27.6%
*Core Rank: A**

[**CV-13**] **Abdul A. Bangash**, Daniil Tiganov, Abram Hindle, and Karim Ali. "Energy Efficient Guidelines for iOS Core Location Framework". 37th International Conference on Software Maintenance and Evolution, 2021.
https://ieeexplore.ieee.org/document/9609120
IEEE ICSME'21, Main Track
Acceptance Rate: 24%
*Core Rank: A**

[**CV-14**] **Abdul A. Bangash**, Hareem Sahar, S Chowdhury, A William Wong, Abram Hindle, and Karim Ali. "What do developers know about machine learning:

a study of ML discussions on StackOverflow". 16th International Conference on Mining Software Repositories, pp. 260-264, 2019.
`https://ieeexplore.ieee.org/document/8816808`
MSR '19, Short Paper
Acceptance Rate: 30%
Core Rank: A

[CV-15] Abdul A. Bangash, Hareem Sahar, and Mirza O. Beg. "A Methodology for Relating Software Structure with Energy Consumption". 17th IEEE International Working Conference on Source Code Analysis and Manipulation, pp. 111-120, 2017.
`https://ieeexplore.ieee.org/document/8090144` *IEEE SCAM '17, Main Track*
Acceptance Rate: 30%
Core Rank: C

[CV-16] Hamza M. Alvi, Hareem Sahar, **Abdul A. Bangash**, and Mirza O. Beg, "EnSights: A tool for energy aware software development", 13th International Conference on Emerging Technologies, pp. 1-6, 2017.
`https://ieeexplore.ieee.org/document/8281713` *IEEE ICET '17, Tool paper*
Acceptance Rate: 30%
Core Rank: Other

PRESENTATIONS

Presentation-1: "Energy Consumption Estimation of API-usage in Smartphone Apps via Static Analysis"
Presentation-2: "Evolution of the Practice of Software Testing in Java Projects"
Presentation-3: "An Empirical Study to Investigate Collaboration Among Developers in Open Source Software (OSS)"
Conference: 20th International Conference on Mining Software Repositories, 2023.
Venue: Convention Exhibition Centre, Melbourne, Australia.

Presentation-4: "Cost-effective Strategies for Building Energy Efficient Mobile Applications"
Conference: 45th IEEE/ACM International Conference on Software Engineering, 2023.
Venue: Convention Exhibition Centre, Melbourne, Australia.

Presentation-5: "A Black Box Technique to Reduce Energy Consumption of Android Apps"
Conference: 44th IEEE/ACM International Conference on Software Engineering, 2022.
Venue: David L. Lawrence Convention Center, Pittsburgh, USA.

Presentation-6: "Energy Efficient Guidelines for iOS Core Location Framework"
Conference: 37th International Conference on Software Maintenance and Evolution, 2021.
Venue: Université du Luxembourg, Luxembourg City, LU.

Presentation-7: "What do developers know about machine learning: a study of ML discussions on StackOverflow"
Conference: 16th International Conference on Mining Software Repositories, 2019.
Venue: Fairmont The Queen Elizabeth Hotel, Montreal, CA.

Presentation-8: "A Methodology for Relating Software Structure with Energy Consumption"

Conference: 17th IEEE International Working Conference on Source Code Analysis and Manipulation, 2017.
Venue: Crowne Plaza Shanghai Fudan, Shanghai, CN.

Invited Talk-1: "Developing Energy Efficient Mobile Applications"
Invited by AIM Research Lab, 2021.
Venue: National University of Computer and Emerging Sciences, Islamabad, PK.

EXTERNAL COLLABORATIONS

Vrije Universiteit, Amsterdam, NL Sep 2023
Under my supervision, a team of Dr. Ivano Malavolta's graduate students worked to replicate a part of my PhD thesis to develop energy-efficient Android applications.

University of Cádiz, Cádiz, ES Sep 2024
With my collaboration, Jose M. Jurado, a PhD student, investigated the trade-off between iOS compiler optimizations for speed with energy consumption.

University of Alberta, Edmonton, CA Sep 2024
With my collaboration, Hareem Sahar, a PhD student, investigated the usefulness of informational retrieval approaches in software defect prediction.

MEMBERSHIP AND SERVICES

Journals

Reviewer	IEEE Transactions on Software Engineering (TSE), 2024
Reviewer	ACM Transactions on Software Engineering and Methodology (TOSEM), 2024
Reviewer	IEEE Transactions on Green Communications and Networking (TGCN), 2020

Conferences

PC Member	The International Conference on Software Maintenance and Evolution (ICSME), Auckland, 2025
PC Member	The International Conference on Mining Software Repositories (MSR), Ottawa, 2025
PC Member	The International Conference on Software Analysis, Evolution and Reengineering (SANER) Montréal, 2025
PC Member	The International Conference on Software Maintenance and Evolution (ICSME), Flagstaff, 2024
PC Member	The International Conference on Mining Software Repositories (MSR), Lisbon, 2024
PC Member	The International Conference on Software Engineering (ICSE), Melbourne, 2023
Publicity & web co-chair	International Symposium on Software Testing and Analysis (ISSTA), Seattle, 2023
Publicity & web co-chair	The European Conference on Object-Oriented Programming (ECOOP), Seattle, 2023
Seminars Coordinator	Programming Languages and Software Engineering (PL/SE) Seminars UofA, 2019-2021
Student Volunteer	The European Conference on Object-Oriented Programming (ECOOP), London, 2019

GRANTS AND AWARDS

Vice-Principal Research (VPR) Postdoctoral Fund $100K

VP Office, Queen's University, Canada, 2023

Alberta Graduate Excellence Scholarship $12,000
FGSR, University of Alberta, Canada, 2022

Graduate Completion Scholarship $5,000
FGSR, University of Alberta, Canada, 2022

Computing Graduate Award for Parents $5,000
Computing Science Department, University of Alberta, Canada, 2021

Alberta Graduate Excellence Scholarship $12,000
FGSR, University of Alberta, Canada, 2021

PhD Early Achievement Award Certificate
FGSR, University of Alberta, Canada, 2020

Alberta Graduate Excellence Scholarship $12,000
FGSR, University of Alberta, Canada, 2020

ACM Travel Grant for ACM-ICSE conference $500
Association for Computing Machinery, 2019

Higher Education Commission's Travel Grant for Canada $1,000
HEC Pakistan, 2019

Doctoral Recruitment Scholarship $10,000
Computing Science Department, University of Alberta, Canada, 2018

Second position in Class of Masters 2015 Silver Medal
FAST National University, Pakistan, 2017

Higher Education Commission's Travel Grant for ICSME-SCAM $2,000
HEC Pakistan, 2017

TECHNICAL SKILLS

Programming languages: Java (EE, SE, Android), Python, R, Swift, C++, C#, HTML, Javascript

Frameworks and libraries: Flask, JSF, JBoss, Hibernate, JDBC, JSP, XML, EJB, JUnit Testing, Selenium, Java Debug, UML Modelling, EMF Soot, MuJava, FlowDroid, Numpy, Pandas, Weka, Greenminer, WoC, Mallet 2.

Tools: Eclipse, Android Studio, R studio, VCS (Git, Bitbucket), Balsamiq, RSA, Matlab, MySql, PostgreSQL, SQL Lite, PuTTY, Jira, Basecamp, Mantis.

OTHER ACTIVITIES

- Raised $100,000+ in Canada to help the flood victims in Pakistan, Al-Burhan Canada, 2022

- Single handily administered a traffic of 23,750 users from 88 countries in COVID lockdown at AWS cloud, Al-Burhan E-learning platform, 2020

- Taught businessmen and laborers the use of Moodle, Al-Burhan, 2018.

- Front desk officer at admission desk, usher at job fair, demonstrator at .Net programming workshop, management officer and vice coordinator at creative department, Fast National University, 2011-2013

LANGUAGES

- Urdu - Mother tongue
- English - Fluent

RESIDENCY STATUS

- Pakistani Citizen

- Canadian Citizen

REFERENCES

Abram Hindle
Professor, Computing Science
University of Alberta, Canada
hindle1@ualberta.ca

Karim Ali
Associate Professor, Computing Science
New York University, UAE
karim.ali@nyu.edu

Bram Adams
IEEE Senior Member, Professor, Computing Science
Queen's University, Canada
bram.adams@queensu.ca