Abdul Ali Bangash

Postdoctoral Fellow at Queen's University
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CURRENT STATUS

Queen's University, Kingston, ON Jul 2023 - Current
Postdoc at SAIL lab with Professor Bram Adams

- Area of research: Generative AI Foundation Models for Software Engineering (FM4SE) and Software Engineering for Foundation Models (SE4FM).
- Achievements: 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`.
- Activities: Currently mentoring 1 Undergrad, 2 Masters and 3 PhD students.

EDUCATION

University of Alberta, Edmonton, CA Sep 2018 - Jun 2023
PhD in Computer Science

- Thesis: Cost-effective Strategies to Develop Energy-Efficient Mobile Applications
- Advisors: Professor Abram Hindle and Professor Karim Ali
- Achievement: PhD Early Achievement Award
- Courses completed:

  Machine Learning in Optimizing Compilers by Jose Nelson Amaral
  Foundations of Program Analysis by Karim Ali
  Machine Learning Applied: Software Engineering by Abram Hindle

FAST National University, Islamabad, PK Sep 2015 - Jul 2017
Masters in Software Engineering

- Thesis: A Methodology to Relate Energy Consumption with Program Execution Structure
- Advisors: Mirza Omer Beg
- Achievements: Silver Medalist

FAST National University, Islamabad, PK Sep 2010 - Jul 2014
Bachelors in Computer Science

- Thesis: An Automate UML to Java Converter
- Advisors: Mirza Omer Beg
- Achievements: Silver Medalist

MEMBERSHIP AND SERVICES

Reviewer for journal	ACM Transactions on SEM (TOSEM), 2024
Reviewer and Program Committee Member	ICSME Flagstaff, 2024
Reviewer and Program Committee Member	MSR Lisbon, 2024
Reviewer Demonstration Track	ICSE Melbourne, 2023
Publicity co-chair in Organizing Committee	ECOOP and ISSTA Seattle, 2023
Web co-chair in Organizing Committee	ECOOP and ISSTA Seattle, 2023
Research Seminars Coordinator	PL/SE Seminars UofA, 2019-2021
Reviewer for journal	IEEE Transactions on GCN, 2020
Student Volunteer	ECOOP London, 2019

GRANTS AND AWARDS

Vice-Principal Research (VPR) Postdoctoral Fund — $50,000
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

JOURNAL PUBLICATIONS

[CV-1] Hareem Sahar, Abdul A. Bangash, Denilson Barbosa, Abram Hindle. "IR-JIT: A simple, online, information retrieval approach for just-in-time software defect prediction". Journal of Empirical Software Engineering, 2024
Springer Nature EMSE '24, ISSN xxxx-xxxx, Impact factor: 4.8

[CV-2] 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, 2024
Springer Nature EMSE '24, ISSN 1382-3256, Impact factor: 4.8

[CV-3] 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-4] 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, 2020
`https://link.springer.com/article/10.1007/s10664-020-09878-9`
Springer Nature EMSE '20, ISSN 1382-3256, Impact factor: 4.8

[CV-5] 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, v.21, pp. 28–46, 2019

https://www.sciencedirect.com/science/article/abs/pii/S2210537918302014
Elsevier SUSCOM '19, ISSN 2210-5379, Impact factor: 4.9

CONFERENCE PUBLICATIONS

[CV-6] Abdul A. Bangash, 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

[CV-7] 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

[CV-8] 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 Award)

[CV-9] Abdul A. Bangash. "Cost-effective Strategies for Building Energy Efficient Mobile Applications". 45th IEEE/ACM International Conference on Software Engineering, 2023.
https://ieeexplore.ieee.org/document/10172629
IEEE ICSE'23, Doctoral Symposium

[CV-10] 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

[CV-11] Abdul A . Bangash, Hareem Sahar, Abram Hindle, Karim Ali. "On the Time-Based Conclusion Stability of Cross-Project Defect Prediction Models". 43rd International Conference in Software Engineering, Journal-First Track, 2021.
https://2021.icse-conferences.org/track/icse-2021-Journal-First-Papers
ICSE '21, Journal First

[CV-12] 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

[CV-13] 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.
MSR '19, Short Paper

[CV-14] 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/8816808 *IEEE SCAM '17, Main Track*

[CV-15] 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*

CONFERENCE TALKS

Talk-1: "Energy Consumption Estimation of API-usage in Smartphone Apps via Static Analysis"
Talk-2: "Evolution of the Practice of Software Testing in Java Projects"
Talk-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.

Talk: "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.

Virtual Talk: "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.

Virtual Talk: "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.

Talk: "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.

Talk: "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.

RESEARCH EXPERIENCE

Queen's University, Kingston, CA Jul 2023 - current
Postdoctoral Fellow

- Working with Dr. Ahmed E. Hassan and Dr. Bram Adams to leverage the power of Foundation models to improve software engineering processes (FM4SE) and to utilize the principles of software engineering to enhance the management of large-language models (SE4FM).

University of Alberta, Edmonton, CA Sep 2018 - Jun 2023
Graduate Research Assistant

- Worked with Dr. Abram Hindle and Dr. Karim Ali to employ static analysis techniques for energy-efficient software development.

FAST National University, Islamabad, PK August 2016 - August 2018
Graduate Research Assistant

- Worked with Dr. Mirza Omer Beg to investigate the characteristics of software code that contribute towards energy consumption.

TEACHING & MENTORING EXPERIENCE

Queen's University, Kingston, CA Jul 2023 - current
As a postdoctoral fellow at the SAIL lab, I am currently co-supervising 1 Undergrad, 2 Masters and 3 PhD students. Most of these projects are related to employing generative AI for Software Engineering and vice versa.

Mentoring students as a Postdoc:

- Zhimin Zou, 2nd year PhD student
  Developing a universal rating system for generative AI Foundation models.
- Yu Shi, 2nd year PhD student
  Developing a realistic history-based evaluation mechanism for generative AI large-language models.
- Adekunle Ajibode, 1st year PhD student
  Working on generative AI foundation models to optimize their release processes.
- Hicham Masri, 1st year Masters student
  Working on prompt mining to investigate the quality of open-source generative AI prompts.
- Anirban Dey, 1st year Masters student
  Working on to leverage large-language models to improve the speed efficiency of CI/CD pipeline.
- Arshdeep Singh, final-year Undergrad student
  Working on to evaluate the quality of tools available 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.
  Published this work as a short-paper at MSR 2023.
- Anisha Islam (Masters Student) & Nipuni Tharushika (Masters Student)
  Replicated previous work on the practice of software testing in Java projects.
  Published this work as a short-paper at MSR 2023.

Courses taught as a 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 Sep 2016 - Aug 2018
During my tenure at FAST, I taught a few courses as lab instructor and co-supervised two undergraduate final-year projects related to energy-efficient software practices.

Courses taught as lab instructor:

EE218 – Assembly Language	Spring'18
EE204 – Computer Architecture	Spring'17

CS310 – Management Information Systems Fall'16 & Fall'17
CS102 – Introduction to Programming Summer'15

External mentoring and collaboration

- A team of Dr. Ivano Malavolta's graduate students at Vrije Universiteit Amsterdam. Replicating a part of my PhD thesis to develop energy-efficient Android applications.
- Hareem Sahar, PhD student at the University of Alberta. Investigating the usefulness of informational retrieval approaches in software defect prediction.

INDUSTRIAL EXPERIENCE

Global Rescue LLC, Boston, based in Pakistan 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, Pakistan 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.

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+ globally to help the flood survivors in Pakistan, Al-Burhan Canada, 2022

- Registered Al-Burhan Canada - a NPO to raise charity for Pakistan, 2022

- Single handily administered a traffic of 23,750 users from 88 countries at Amazon Web Services, Al-Burhan Canada, 2020

- Configured, deployed, and monitored Learning Management System Moodle, Al-Burhan Canada, 2020

- Taught businessmen and laborers how to use 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

REFERENCES

Will be furnished upon request.