

Ridwanul Hasan Tanvir

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EDUCATION

Pennsylvania State University

January 2024 - Present

Ph.D. in Computer Science and Engineering
Department of Computer Science and Engineering

Bangladesh University of Engineering and Technology

April 2018 - May 2023

Bachelor of Science in Computer Science and Engineering
Department of Computer Science and Engineering

Notre Dame College

July 2015 - June 2017

Higher Secondary Certificate (HSC)

PUBLICATIONS

• Using Large Language Models to Generate JUnit Tests: An Empirical Study

28th International Conference on Evaluation and Assessment in Software Engineering ([EASE 2024](#))

Authors: Mohammed Latif Siddiq, Joanna CS Santos, **Ridwanul Hasan Tanvir**, Noshin Ulfat, Fahmid Al Rifat, and Vinicius Lopes

RESEARCH EXPERIENCE

University of Notre Dame, Indiana, USA

December, 2022 - December, 2023

- Sueprvisor: [Joanna C. S. Santos](#), Assistant Professor, Department of CSE, University of Notre Dame
- Using large language models to automatically generate JUnit tests for Java, assessing their effectiveness in terms of compilation rates, correctness, coverage, and presence of test smells.

Bangladesh University of Engineering and Technology, Bangladesh

May, 2023 - December, 2023

- Sueprvisor: [Dr. Anindya Iqbal](#), Professor, Department of CSE, BUET
- Develop machine learning algorithms that automatically generate test cases for both positive and negative testing.
- Execute test cases from Natural Language Instructions to Actual Mobile Applications using Large Language Model.

Bangladesh University of Engineering and Technology, Bangladesh

May, 2022 - June, 2023

- Sueprvisor: [Dr. Atif Hasan Rahman](#), [Md. Abul Hassan Samee](#)
- Unsupervised probabilistic clustering method of single-cell RNA-sequencing

PROFESSIONAL EXPERIENCE

Research and Innovation Center for Science and Engineering

May, 2023 - December, 2023

- Collaborated with Samsung R&D Institute Bangladesh (SRBD)
- For Mobile Applications (Samsung Contact and Samsung Settings) Manual Test case generation required hundreds of Manual hours. Utilizing Machine Learning and open source Large Language Models, we automated the full pipeline.

NOTABLE PROJECTS

Bangla Named Entity Recognition | *NLP Hackathon Bangladesh— 2nd Runner Up* January, 2023

- Two-day hackathon was conducted by Amazon Alexa Applied Scientist [Sudipta Kar](#) and [Dr. Farig Yousuf Sadeque](#).
- Developed two models. Employed the CRF (Conditional Random Field) algorithm for the feature-based model.
- Implemented the BanglaBERT (large) model for the deep learning approach.

Grammatical Error Detection | *Bhashabhrom Hackathon — Champion* March, 2023

- To detect sub-strings of a Bangla text that contain grammatical, punctuation, or spelling errors.

DealFinder | *Django, JavaScript* February, 2022

- A platform for users to access and stay informed about all the latest technology deals and promotions.
- Automatically applies coupon codes and discounts to online purchases.

ACADEMIC PROJECTS

BUET Photographic Society | *React, Django, Bootstrap* August, 2022

- High-Quality Photography community and marketplace Customizable portfolio to showcase your work. Community engagement through comments, likes, shares, and challenges Opportunities to participate in various photo challenges and contests organized (Quest). Prizes offered for top-performing entries that vary from challenge to challenge. Access to feedback from judges and other photographers which can help improve your photography skills. [\[Source Code\]](#)
- Supervisor: [Dr. Anindya Iqbal](#), Professor, Department of CSE, BUET

Retransmission Timeout Weighted Median | *Network Simulator 3(NS3), C, Python, GNUPlot* February, 2022

- Implemented recursive weighted median (RWM) using NS3 which yields significantly tighter RTT bounds than Jacobson's algorithm over Internet traffic with heavy tailed statistics. The RWM filters are more effective in impulsive signal environments, which is often the case with RTT signals with heavy tailed statistics. [\[Source Code\]](#)

Scheduling and Memory Management in xv6 January, 2022

- Implemented lottery scheduling algorithm and page replacement algorithms: FIFO and LRU. [\[Source Code\]](#)

Drone-based Hardware | *C, AtMega32, Atmel Studio, Proteus 8, Arduino* September, 2021

- Microcontroller project for Drone and Flight Controller
- Designed a fully functional software simulation and later, built a working hardware prototype. [\[Source Code\]](#)
- Supervisor: [Dr. A. B. M. Alim Al Islam](#), Professor, Department of CSE, BUET

Yet-Another-C-Compiler | *Flex, Bison, EMU 8086* July, 2021

- Symbol Table, Lexical Analysis, Syntax and Semantic Analysis and Intermediate Code Generation which as a whole translates computer code written in C into Assembly. [\[Source Code\]](#)

Security Tool: Data Loss Prevention May, 2021

- Support for regular expressions and keyword matching to identify sensitive data. Configurable scanning options for individual computers or entire networks. [\[Source Code\]](#)

Bikroy Maven | *Django, Bootstrap, Python, Oracle SQL* December, 2020

- Sellers can post ads and buyers can contact them directly to make a purchase. Allows employers to create and publish job openings for their organization. Allows candidates to accept job offers from prospective employers. Chat messaging feature for direct communication between buyers and sellers. Location-based search functionality to help users find products or services in particular area. [\[Source Code\]](#)

Skyfall Savior | *C, iGraphics Custom Library* July, 2018

- A simple 2D graphical shooting adventure game with multiple levels. Built using a custom graphics library written in C. Supports system collision, ranking and extra life system.

- Promotes sustainability and collaborative consumption. Peer-to-peer sharing system. Sharing of products including books, jackets, electronics, musical instruments, and sports equipment. Convenient and accessible for university students. [\[Source Code\]](#)

- Supervisor: [Dr. Mohammad Saifur Rahman](#), Associate Professor, Department of CSE, BUET

LEADERSHIP EXPERIENCES

- President of Student Council in High School
 - Collaborated with students and faculty to enhance the school community.
- High School Debate Team Champion
 - Led the debate team to victory in regional and national competitions.
 - Developed strong public speaking and critical thinking skills.

CERTIFICATES

Deep Learning Specialization (offered by DeepLearning.AI)

CS50W: CS50's Web Programming with Python and JavaScript (offered by HarvardX)

Machine Learning Foundations: A Case Study Approach (offered by University of Washington)

Convolutional Neural Networks (offered by DeepLearning.AI)

SD3x: Algorithm Design and Analysis (offered by PennX, University of Pennsylvania)

ACHIEVEMENTS AND AWARDS

Notre Dame College: 2015, 2016

Perfect Attendance for 2 Years at Notre Dame College

Research Grant, 2023

RISE-(Research and Innovation Center for Science and Engineering) Grant: Of BDT 81000

CUET Admission Test, 2017

Acquired merit position 2 in the whole country

Inter University Cyber Drill, 2022

Position: 13th

Bangla Grammatical Error Detection Challenge, 2023

Position: **Champion**

Bangladesh's First NLP Hackathon, 2023

Position: 2nd Runner Up

National Undergrad Math Olympiad, 2021

Position: 7th

Dean's List, 2019

Faculty of Electrical and Electronic Engineering, BUET

University Merit Scholarship, 2019

Government Scholarship, Bangladesh: 2022, 2017, 2015, 2013

REFERENCES

Joanna C. S. Santos [[Website](#)]

Assistant Professor

Department of Computer Science and Engineering

University of Notre Dame

Email: joannacss@nd.edu

Dr. Atif Hasan Rahman [[Google Scholar](#)]

Associate Professor

Department of Computer Science and Engineering

Bangladesh University of Engineering and Technology

Email: atif AT cse DOT buet DOT ac DOT bd

Md. Abul Hassan Samee [[Google Scholar](#)]

Assistant Professor

Department of Integrative Physiology

Baylor College of Medicine

Email: samee@bcm.edu