

# Ridwanul Hasan Tanvir

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## EDUCATION

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<b>Pennsylvania State University</b> Ph.D. in Computer Science and Engineering Department of Computer Science and Engineering	January 2024 - Present  CGPA: 4.00/4.00
<b>Bangladesh University of Engineering and Technology</b> Bachelor of Science in Computer Science and Engineering Department of Computer Science and Engineering	April 2018 - May 2023
<b>Notre Dame College</b> Higher Secondary Certificate (HSC)	July 2015 - June 2017

## PUBLICATIONS

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- **Using Large Language Models to Generate JUnit Tests: An Empirical Study**  
28<sup>th</sup> 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

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<b>University of Notre Dame, Indiana, USA</b>	December, 2022 - December, 2023
<ul style="list-style-type: none"><li>• Sueprvisor: <a href="#">Joanna C. S. Santos</a>, Assistant Professor, Department of CSE, University of Notre Dame</li><li>• 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.</li></ul>	
<b>Bangladesh University of Engineering and Technology, Bangladesh</b>	May, 2023 - December, 2023
<ul style="list-style-type: none"><li>• Sueprvisor: <a href="#">Dr. Anindya Iqbal</a>, Professor, Department of CSE, BUET</li><li>• Develop machine learning algorithms that automatically generate test cases for both positive and negative testing.</li><li>• Execute test cases from Natural Language Instructions to Actual Mobile Applications using Large Language Model.</li></ul>	
<b>Bangladesh University of Engineering and Technology, Bangladesh</b>	May, 2022 - June, 2023
<ul style="list-style-type: none"><li>• Sueprvisor: <a href="#">Dr. Atif Hasan Rahman</a>, <a href="#">Md. Abul Hassan Samee</a></li><li>• Unsupervised probabilistic clustering method of single-cell RNA-sequencing</li></ul>	

## PROFESSIONAL EXPERIENCE

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<b>Research and Innovation Center for Science and Engineering</b>	May, 2023 - December, 2023
<ul style="list-style-type: none"><li>• Collaborated with Samsung R&amp;D Institute Bangladesh (SRBD)</li><li>• 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.</li></ul>	

## NOTABLE PROJECTS

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**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

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**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

## CERTIFICATES

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### TOEFL iBT

Total: 107 (Out of 120, 30 Per section)

Reading: 27, Listening: 28, Speaking: 24, Writing: 28

### Other Certifications

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)

### Problem Solving

Kaggle Expert

EEE DAY 2023 Datathon Champion

## LEADERSHIP EXPERIENCES

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- President of Student Council
  - Collaborated with students and faculty to enhance the community.
- High School Debate Team Champion
  - Developed strong public speaking and critical thinking skills.
- Contributed to Promoting Democratic Institutions and Practices ([PRODIP](#))
  - Raised awareness of democratic practices.
  - Promoted transparency in governance.

## HIGHLIGHTED ACADEMIC COURSES

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### Graduate Course, Pennsylvania State University

CSE 566: Algorithms and Data Structures in Bioinformatics

CSE 511: Operating Systems Design

### Undergraduate Course, Bangladesh University of Engineering and Technology

CSE-463 Introduction to Bioinformatics

CSE-409 Computer Graphics

CSE-421 Basic Graph Theory

CSE-471 Machine Learning

## ACHIEVEMENTS AND AWARDS

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### Grants:

#### **Reserarch Grant, 2023**

Research and Innovation Center for Science and Engineering Grant of BDT 81,000

#### **Bangladesh Open Source Network - BdOSN**

Grant of BDT 20,000

#### **Bengali.AI**

Research Grant of BDT 75,000

### Awards:

#### **Notre Dame College: 2015, 2016**

Perfect Attendance for 2 Years at Notre Dame College

#### **CUET Admission Test, 2017**

Acquired merit position 2 in the whole country

#### **Inter University Cyber Drill, 2022**

Position: 13<sup>th</sup>

#### **Bangla Grammatical Error Detection Challenge,2023**

Position: **Champion**

#### **Bangladesh's First Natural Language Processing Hackathon, 2023**

Position: 2<sup>nd</sup> **Runner Up**

#### **National Undergrad Math Olympiad, 2021**

Position: 7<sup>th</sup>

#### **Dean's List: 2019, 2023**

Faculty of Electrical and Electronic Engineering, BUET

#### **University Merit Scholarship, 2019**

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

## REFERENCES

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**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

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

Assistant Professor

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