

# FARIHA TABASSUM ISLAM

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## EDUCATION

### Bangladesh University of Engineering & Technology (BUET)

*Master of Science, Computer Science & Engineering*

Jun 2021

CGPA 3.92 out of 4.00

Thesis: A Privacy-enhanced Approach for Planning Safe Routes with Crowdsourced Data and Computation

### Bangladesh University of Engineering & Technology (BUET)

*Bachelor of Science, Computer Science & Engineering*

Oct 2018

CGPA 3.89 out of 4.00 (11<sup>th</sup> out of 126)

Thesis: An Efficient Approach for Real-Time Crowdsourced Package Delivery using Public Transport Networks

## WORK EXPERIENCE

Feb 2019 - now (4 years)

### Lecturer

Feb 2019 - Present

*Dept. of Computer Science & Engineering, United International University*

### Part-time Research Assistant

Jan 2022 - Present

*Dept. of Computer Science & Engineering, Bangladesh University of Engineering & Technology*

### High Profile ICT Scholar Fellow

Jun 2019 - Jun 2020

*ICT Division, Govt. of Bangladesh*

## PUBLICATION

### A Privacy-Enhanced and Personalized Safe Route Planner with Crowdsourced Data and Computation

*Fariha Tabassum Islam, Tanzima Hashem, Rifat Shahriyar*

*ICDE 2021 (CORE Rank A\*), DOI 10.1109/ICDE51399.2021.00027*

[Full research paper] [Presenter]

### A Crowd-enabled Solution for Privacy-Preserving and Personalized Safe Route Planning for Fixed or Flexible Destinations

*Fariha Tabassum Islam, Tanzima Hashem, Rifat Shahriyar*

*TKDE 2023 (IF 9.235), DOI 10.1109/TKDE.2023.3234703*

[Full research paper]

### MTUL: A Novel Approach for Multi-Trajectory User Linking

*Fariha Tabassum Islam\*, Md. Tareq Mahmood\*, Mahmuda Naznin*

*NSysS 2022, Acceptance Rate 27%, DOI 10.1145/3569551.3569554*

[Full research paper]

### Representative Dissimilar Path Queries: Understanding Human Movement Dynamics in Road Networks

*Tanzima Hashem, Matt Duckham, Mahathir Monjur, Fariha Tabassum Islam*

*Journal of Spatial Information Science (JOSIS) 2022*

[Full research paper]

## FELLOWSHIP

### High Profile ICT Scholar Fellowship, ICT Division, Govt. of Bangladesh | BDT 2.4 Million

2019

- Selected after competing in two phases: a test on undergrad studies; writing and presenting a research proposal

## RESEARCH EXPERIENCES

Sep 2017 - now (5 years)

### Safe route planner | *Master's thesis, published in ICDE2021, extension accepted in TKDE*

2019-2022

Computes safe routes for fixed or flexible destinations for a user or group using crowd data while preserving privacy.

- Collaborated in designing the system architecture, safety quantification model and two efficient algorithms to compute safest routes while preserving privacy
- Identified and proved the necessary conditions for choosing the safety quantification parameters to maintain privacy
- Analyzed, visualized, and prepared road network, crime, and user-checkins data using Python (Pandas, OSM)
- Simulated the full system and wrote all experiments using Java (~35K lines of code)
- Developed an Android prototype using SparkJava and Firebase

### Learning safe routes | *Extension of safe route planner*

2022-ongoing

Learns to compute safe routes for a source-destination pair in a road network utilizing federated learning for privacy.

- Identified the gaps of existing relevant works and the challenges of learning safe routes
- Designing ML pipeline to train the route planner

- Crowdsourced package delivery in public transport network** | *Undergrad thesis* 2017-2019  
 Computes package delivery routes that match commuters' pre-planned journeys in a public transport network.  
 · Collaborated in designing efficient algorithms by precomputing a summary graph  
 · Used GTFS data and analyzed, visualized, and prepared Myki data (~30GB) using PostgreSQL and Python  
 · Wrote *all* experiments using Java (~20K lines of code)
- Trajectory user linking** | *Data Mining master's course project, published in NSysS 2022* 2020  
 Identifies a user from his/her multiple available trajectories using GRU autoencoder.  
 · Worked on problem formulation, data preparation using Python, partial implementation using PyTorch, and writing
- Dissimilar route finding** | *accepted in JOSIS* 2022  
 Finds a set of most dissimilar routes from sets of representative routes for different features.  
 · Implemented parts of experiment codes in C++ and Python and worked on the revision phase
- Mobile image analysis in healthcare** | *A survey manuscript under preparation* 2020 - Ongoing  
 Utilizes smartphone cameras and sensors to screen various diseases for preliminary healthcare, especially considering underserved people  
 · Mentored undergrads in writing the survey paper and contributed to writing
- Credit card fraud detection** | *Network Security master's course project* 2020  
 Detects credit card fraud using Siamese network.  
 · Collaborated in designing the ML pipeline, implementation, and writing a report in a group of two
- Reference Guided Genome Annotation** | *Computational Biology master's course project* 2019  
 Annotates a target genome using a closely related, well-annotated reference genome using ensemble of RATT, Glimmer and BLAST.

## SKILLS

- Java, Python (Scikit-learn, NumPy, SciPy, Keras basics, PyTorch, Selenium), C++, SQL, Android app development, Rust, Git – used in
- Research experiments
  - Data analysis and visualization
  - Course projects during undergrad and master's
  - Teaching

## AWARDS & SERVICES

- First runner-up group | Hackathon for Women 2017 (36 hours) by ICT Division, Govt. of Bangladesh
- First runner-up group | Women's Day Innovation Challenge 2017, Facebook Developer Circle, Dhaka
- University Merit | BUET - 2015, 2017
- Dean's Honor List | BUET - 2015-18

**Reviewer.** WISE (2021, 2022), NSysS (2020, 2021), APWeb-WAIM (2019)

## NOTABLE TEACHING EXPERIENCES

### Undergraduate Courses:

Theory. Object Oriented Programming, Data Structure and Algorithms I & II, Artificial Intelligence, Compiler.

Lab. Introduction to Computer Systems, Structured Programming Language, Data Structure and Algorithms II, Artificial Intelligence, Pattern Recognition, System Analysis and Design, Software Engineering, Compiler.

- Taught nine trimesters so far
- Singlehandedly taught four to six sections each trimester from lecture delivery, examinations/assignments setting to grading; each section consists of 30 to 40 students
- Coordinated one or two courses each trimester
- Held counseling hours
- Approximately 36 hours spent per week

## STANDARDIZED TESTS

TOEFL: 111 (R:30, L:29, S:25, W:27)