

# TAOSEEF ISHTIAK

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## Career Objective

I have the aim to engage myself in research and academia.

## Personal Statement

As a recent award-winning graduate, completing B.S. in Computer Science and Engineering, I am motivated to build my professional career in research and academics; where I can gain deeper knowledge through building advanced applications. My research interest is in the domains of Computer Vision, Natural Language Processing, Statistical Machine Learning, Big Data, and Data Mining related developments. With the experience of being a member in R&D of one of the most prestigious international student chapters in Computing Association (NSU ACM Student Chapter), I have gained my opportunity to get involved in core software development, research, leadership, team management and organizational activities.

## Technical Skills

### Development Expertise

Computer Vision and Statistical Machine Learning-based model architecture.  
Back-End/Full-stack web/android application development.

### Programming and Query Languages

Python, Java, PHP, JavaScript,  
C++, SQL, MongoDB

### Frameworks, Libraries and Tools

OpenCV, Keras, TensorFlow, PyTorch, Tableau,  
Google Cloud Platform, Laravel, Node.js with Express

### Utilities

Git, Anaconda, Google Colab

### Other IT Expertise

MS Office, Adobe Illustrator, Adobe Photoshop,  
CorelDRAW, AutoCAD

### Language and Communication

Fluent in Reading, Speaking, and Writing in English and Bengali

### Interests

Algorithms, Computer Vision, Natural Language Processing, Big Data, Machine Learning, Reinforcement Learning, Data Mining, and Software Engineering.

### Hobby

Traveling, Reading Books.

## Education and Qualifications

2016 - 2019

### B.S. Computer Science and Engineering

#### North South University

- CGPA 3.79
- Recipient of **Magna Cum Laude Award** for academic performance.
- Awarded the “**Champion of Innovation Challenge Season- 8**” for best undergraduate Senior Design Capstone and thesis project.

2013 - 2015

### Higher Secondary School Certificate

#### Notre Dame College, Dhaka.

- GPA 5.00
- Awarded “**Honorable Mention**” based on academic result and co-curricular activities.

2013

### Secondary School Certificate

#### Ideal School and College.

- GPA 5.00

# Work Experience

January, 2020 – Present

**Lab Officer**

**Department of ECE, North South University**

- Real time coding in C, Java and Python
- Digital Logic Design and Computer Architecture based hardware implementation

December, 2017 – Present

**Research Assistant**

**Department of ECE, North South University**

**Department of ESM, North South University**

- Road state classification and pothole detection system.
- Real time Water Quality Monitoring through Wireless Sensor Networks.
- Coastal Area Vulnerability Assessment.
- Web-based Fecal sludge management (FSM) for WaterAid and Saidpur Pouroshobha, Bangladesh

January, 2019 – December, 2019

**Teaching Assistant**

**Department of ECE, North South University**

**Courses Taught:**

- Java Programming Language
- Data Structure and Algorithms
- Design and Implementation of Algorithms

September, 2019 - Present

**Machine Learning workshop instructor**

**IEEE NSU Student Branch.**

May, 2018 – Present

**Member of R&D, NSU ACM Students Chapter.**

October, 2018 – November, 2019

**Sub-Executive, NSU ACM Students Chapter**

March, 2017 – November, 2018

**Front-End developer at Doctorbaari .**

## **Awards and Achievements**

### **1. Champion in North South University Innovation Challenge Season 8: Senior Design Capstone Thesis**

#### **Project Showcasing.**

Project: “A Complete Road Health Monitoring System for Bangladesh”.

### **2. Merit-based Waiver Awardee.**

100% tuition waiver recipient based on Academic Performance at North South University.

### **3. 2<sup>nd</sup> Runner of Up IEEE Day Hackathon, 2017.**

Project: “IoT-based An advanced application to decrease household electricity consumption based on weather information.”

### **4. 2<sup>nd</sup> Runner Up of NSU Intra University Line Follower Robot Competition Summer 2017.**

### **5. Board Scholarship (General Category) Awardee.**

Higher Secondary School Certificate Examination, 2015.

### **6. Board Scholarship (Talent-pool Category)**

Secondary School Certificate Examination, 2013.

### **7. Various achievements in scientific project development, extempore speech; Math, and Biology**

Olympiad competitions during Secondary and Higher Secondary School.

## **Participation in Co-curricular Activities**

**1.** Technovation 2.0 || 2019.

**2.** Innovation Challenge Season 8 || 2019.

**3.** HACK NSU || 2019.

**4.** Cybernauts || 2018.

**5.** Esonance. || 2017.

**6.** National Power and Energy Hackathon || 2017.

**7.** IEEE Day Hackathon || 2017.

**8.** Intra University Line Follower Competition. || 2016

**9.** Bangladesh Academy of Science Olympiad || 2015.

**10.** 35<sup>th</sup> National Science and Technology Week. || 2014.

**11.** Notre Dame Annual Science Festival 2014 and 24<sup>th</sup> GKC.

## Completed Respective Courses in Computer Science and Mathematics

- CSE 115(&Lab): Programming Language I  
**Outcome:** Basic programming knowledge with C.
- CSE 173: Discrete Mathematics  
**Outcome:** Concept of mathematical arguments using propositions, predicates, logical connectives, quantifiers, rules of inference, appropriate proof methods, types and properties of sets, relations, functions, graphs, and trees, recursive functions.
- CSE 215(&Lab): Programming Language II  
**Outcome:** Object oriented programming knowledge with Java.
- CSE 225(&Lab): Data Structure & Algorithm  
**Outcome:** Concept of data structure with C++.
- CSE 231(&Lab): Digital Logic Design  
**Outcome:** Concept of Boolean logic, Boolean algebra, combinational and sequential Circuits.
- CSE 299: Junior Design  
**Outcome:** Team work, Project: Roads360: Road Image Classification of Bangladesh, 2 Conference Papers.
- CSE 311(&Lab): Database Management System  
**Outcome:** SQL Database, Back-end PHP, HTML, Bootstrap.
- CSE 332(&Lab): Computer Organization and Architecture  
**Outcome:** MIPS architecture, Datapath, Pipeline.
- CSE 323: Operating Systems Design  
**Outcome:** Algorithms behind operating systems, hands on Linux Commands, Threads.
- CSE 331(&Lab): Microprocessor Interfacing & Embedded System  
**Outcome:** 8086 architecture, assembly language, microcontroller, Arduino.
- CSE 327: Software Engineering  
**Outcome:** Software Design Patterns, Agile software development, Express with Node.js, MongoDB, hands of version control and Git.
- CSE 425: Concepts of Programming Language  
**Outcome:** Construction and conception of grammar in programming language, compiler design.
- MAT125: Linear Algebra  
**Outcome:** concepts and techniques of linear algebra, system of linear equations, matrices and inverses, determinants, vector spaces, eigenvalues and eigenvectors, Markov processes.
- MAT 361: Probability and Statistics  
**Outcome:** Concept of data and variables, mean, median, mode, variance, standard deviation. random variables and their probability function, binomial distribution, joint distribution of two random variables, geometric distribution, hypergeometric distribution, normal distribution, central limit theorem.
- CSE 445: Machine Learning  
**Outcome:** Linear Regression, Logistic Regression, SVM, Neural Network, KNN.
- CSE 465: Pattern Recognition and Neural Network  
**Outcome:** Hands on advanced Python practice, Concept and Implementation of ANN, CNN, RNN, and Generative Adversarial Networks.
- CSE 419: Data Mining (Audited)  
**Outcome:** Data representation, statistical ML, dimensionality reduction, conception of decision tree, anomaly detection, apriori principle.
- CSE 438(& Lab) Data Communication & Network  
**Outcome:** ISO-OSI reference model, design issues and protocols in the physical layer, data link layer and network layer, standards in network access protocols, an overview of networking and communication software.
- CSE 499(A&B): Senior Design Capstone Project and Thesis  
**Outcome:** Team work, Project: A Complete Road Health Monitoring System for Bangladesh.
- Fundamentals of Reinforcement Learning (on Coursera)  
**Outcome:** Concepts on Markov Decision Processes, the exploration/exploitation tradeoff, value functions, dynamic programming as an efficient solution approach to an industrial control problem. *Certification:*  
[coursera.org/verify/B4WBSW9UQX2G](https://coursera.org/verify/B4WBSW9UQX2G)
- Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning (on Coursera)  
**Outcome:** Using TensorFlow to train neural networks for several computer vision applications. *Certification:*  
[coursera.org/verify/QX93YL4YG88T](https://coursera.org/verify/QX93YL4YG88T)
- Neural Networks and Deep Learning (on Coursera)  
**Outcome:** Understanding the algorithms and mathematics behind artificial neural networks, back propagation, gradient descent in python. *Certification:*  
[coursera.org/verify/4LU74TVZVG34](https://coursera.org/verify/4LU74TVZVG34)
- Convolutional Neural Networks (on Coursera)  
**Outcome:** Understanding the algorithms and mathematics behind convolutional neural networks, facial recognition and object detection system, neural style transfer. *Certification:*  
[coursera.org/verify/5W25VM8ZY8GE](https://coursera.org/verify/5W25VM8ZY8GE)
- Sequence Models (on Coursera)  
**Outcome:** Understanding the algorithms and concepts behind recurrent neural network, GRU, LSTM, word representation and word embedding, Beam search, the Attention model, machine translation, trigger word detection. *Certification:*  
[coursera.org/verify/MVN8Z3HTBRVQ](https://coursera.org/verify/MVN8Z3HTBRVQ)

## Selected Projects

**01.** Blood Glucose Level Prediction using Android Smartphones with Software Engineering and Machine Learning Techniques.

// April 2020 – Ongoing

**02.** Road State Classification with customized CNN and modified **Inception-v4** network.

// October 2018 – March 2019

**03.** Pothole and Road Crack Detection system with **Semantic Image Segmentation model: YOLACT**, and **Data Mining techniques**.

// January 2019 – January 2020

**04.** Tree-based feature selection for improving training accuracy on Human Activity Recognition; with **Extra-Tree Classifier and Random Forest**.

// December 2019 – February 2020

**05.** Statistical Machine Learning for dimensionality reduction (**Backward Elimination**), Full Stack Android and Web Application with **Laravel** development for Coastal Disaster Vulnerability Data Collection of Bangladesh.

// February 2018 – October 2019

**06.** Implementation of **UNet++: A Nested U-Net Architecture for Medical Image Segmentation**, introduced by Z. Zhou, M. M. R. Siddiquee, N. Tajbakhsh, and J. Liang arXiv:1807.10165v1 [cs.CV] 18 Jul 2018, on KITS 2019 Kidney and Kidney Tumor Segmentation Challenge.

// October 2019 – December 2019

**07.** “Groupee”- a web application built with **Node.js and Express** to maintain team management and group tasks.

// October 2018 – December 2018

**08.** Web and Backend system development for Sewage Treatment Plant Monitoring of North South University: with **PHP and Chart.js**.

// December 2017 – August 2019

**09.** IoT-based online Environment Data Logger and automatic alarm system for disaster management and industrial usage.

// January 2018 – April 2018

**10.** An IoT-based device to calculate electricity consumption and sending data to with **JavaFX-based desktop application and ngrok** server.

// June 2017 – April 2018

## Publications

- 01. Conference Paper:** Tasmin, M., Ishtiak, T., Ruman, S. U., Suhan, A. U. R. C., Islam, N. S., Jahan, S., ... & Rahman, R. M. (2020, August). Comparative Study of Classifiers on Human Activity Recognition by Different Feature Engineering Techniques. *In 2020 IEEE 10th International Conference on Intelligent Systems (IS) (pp. 93-101). IEEE.*
- 02. Journal Article:** Jakariya, M., Alam, M. S., Rahman, M. A., Ahmed, S., Elahi, M. L., Khan, A. M. S., Saad S., Tamim H. M., Ishtiak T., Sayem S. M., & Ali, M. S. (2020). Assessing climate-induced agricultural vulnerable coastal communities of Bangladesh using machine learning techniques. *Science of The Total Environment*, 140255.
- 03. Conference Paper:** *Indexed by Scopus:* T. Ishtiak,, S. Ahmed, M.H. Anila, S. Islam, R. Shelim, T. Farah, "Road state classification of Bangladesh with convolutional neural network approach", (2019) *WMSCI 2019 - 23rd World Multi-Conference on Systemics, Cybernetics and Informatics, Proceedings, 4*, pp. 129-134.
- 04. Journal Article:** Ahmed, S., Ishtiak, T., Suhan, A. U. R. C., Anila, M. H., & Farah, T. Road State Classification of Bangladesh with Convolutional Neural Network Approach.", (2019) *Journal of Systemics, Cybernetics and Informatics: JSCI, Volume 17 - Number 4* (extended version for journal publication).
- 05. Conference Paper:** T. Ishtiak, S. Ahmed, M. H. Anila and T. Farah, "A Convolutional Neural Network Approach for Road Anomalies Detection in Bangladesh with Image Thresholding", *2019 Third World Conference on Smart Trends in Systems Security and Sustainability (WorldS4), London, United Kingdom, 2019*, pp. 376-382. doi: 10.1109/WorldS4.2019.8903936.
- 06. Conference Paper:** S. Rezwan et al., "A Minimalist Model of IoT based Sensor System for Sewage Treatment Plant Monitoring", *2019 IEEE 10th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON), Vancouver, BC, Canada, 2019*, pp. 0939-0945. doi: 10.1109/IEMCON.2019.8936182.
- 07. Conference Paper:** T. Ishtiak, R. M. Orpon, N. Mashnoor, M. Ahmed and M. A. Nazim, "An advanced application to decrease household power consumption and save energy detecting the weather condition," *2017 8th IEEE Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON), Vancouver, BC, 2017*, pp. 622-627. doi: 10.1109/IEMCON.2017.8117168.