

# TONMOY HOSSAIN

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## Summary

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- Lecturer at the Department of Computer Science and Engineering, Ahsanullah University of Science and Technology (AUST)
- Completed B.Sc. from the Department of Computer Science and Engineering, Ahsanullah University of Science and Technology (AUST)
- Research experience in Machine Learning Applications, Computer Vision, Data Mining, and Image Processing
- Extremely passionate about Generative Models, Reinforcement Learning, Deep Learning, and its sub-fields

## Education

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**Ahsanullah University of Science and Technology**

*B.Sc. in Computer Science and Engineering (CSE)*

**GPA: 3.842** on a scale of 4.00 (3<sup>rd</sup> position out of 152 students)

**Dhaka, Bangladesh**

*May 2015 - July 2019*

## Teaching Experience

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**Lecturer**

*Department of Computer Science and Engineering*

*Ahsanullah University of Science and Technology*

**August 2019 - Present**

## Research Interests

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Machine Learning, Deep Learning & its applications, Computer Vision, Image Analysis, and Data Mining

## Undergraduate Thesis

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**Brain Tumor Detection using Convolutional Neural Network**





*Supervisor: Faisal Muhammad Shah, Associate Professor, Dept. of CSE, AUST.*

We worked on different types of MRI images in this research work. The main objective is to detect the abnormal tissues on the MRI and segment the malignant cells known as brain tumor from the MRI as well as try to find an optimal location of the region of interest. We have developed an ensemble deep learning architecture integrating with a modified FCM segmentation to detect the abnormalities. Furthermore, our classification model worked well on other types of medical imaging sectors.

## Publications

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- **Tonmoy Hossain**, Sujan Sarker, Sejuti Rahman, and Md Atiqur Rahman Ahad, “**Skeleton-based Human Action Recognition on Large-Scale Datasets: Is Deep Learning the Best Approach?**”, Submitted and under review in *Pattern Recognition Letters*, Elsevier.  
  
Shithi Maitra, Tonmoy Hossain, Khan Md. Hasib and Fairuz Shadmani Shishir, “**Graph Theory for Dimensionality Reduction: A Case Study to Prognosticate Parkinson’s**,” 2020 11th IEEE Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON), Vancouver, BC, Canada, 2020, pp. 0134-0140, doi: 10.1109/IEMCON51383.2020.9284926. **\*\*Best Paper Award\*\*** under *Data Mining and Data Analytics and Big Data* Category.
- Sujan Sarker, Sejuti Rahman, **Tonmoy Hossain**, Syeda Faiza Ahmed, Lafifa Jamal, and Md Atiqur Rahman Ahad, “**Skeleton-based Activity Recognition: Preprocessing and Approaches**”, Accepted and will be published in *Contactless Human Activity Analysis*, Springer Verlag, Germany.
- Sifat Ahmed, **Tonmoy Hossain**, Oishee Bintey Hoque, Sujan Sarker, Sejuti Rahman, Faisal Muhammad Shah, “**Automated COVID-19 Detection from Chest X-Ray Images : A High Resolution Network (HRNet) Approach**”, Pre-print version published at *Research Square*. 
- Ashek Seum, Amir Hossain Raj, Shadman Sakib, **Tonmoy Hossain**, “**A Comparative Study of CNN Transfer Learning Classification Algorithms with Segmentation for COVID-19 Detection from CT Scan Images**” Accepted in 11<sup>th</sup> International Conference on Electrical and Computer Engineering, Dhaka, Bangladesh (ICECE 2020)
- Faisal Muhammad Shah, Sajib Kumar Saha Joy, Farzad Ahmed, **Tonmoy Hossain**, Mayeesha Humaira, Amit Saha Ami, Shimul Paul, Md Abidur Rahman Khan Jim, Sifat Ahmed, “**A Comprehensive Survey of COVID-19 Detection using Medical Images**”, Pre-print version published at *engrXiv* (Under review in *SN Computer Science Journal*) 
- Faizah Binte Naquib, Sharika Tabassom, Fariha Elahee, Farhana Mim, **Tonmoy Hossain**, Kazi A Kalpoma, “**Modified Maximum Curvature Method (MMCM) and Logistic Regression: A Hybrid Architecture for Finger Vein Biometric Recognition System**” Accepted in 23<sup>rd</sup> International Conference on Computer and Information Technology, Dhaka, Bangladesh (ICCIT 2020)
- Fariha Elahee, Farhana Mim, Faizah Binte Naquib, Sharika Tabassom, **Tonmoy Hossain**, Kazi A Kalpoma, “**Comparative Study of Deep Learning based Finger Vein Biometric Authentication Systems**” Accepted in 2nd International Conference on Advanced Information and Communication Technology, Dhaka, Bangladesh. (ICAICT 2020)
- Fairuz Shadmani Shishir, **Tonmoy Hossain** and Faisal Muhammad Shah, “**EsharaGAN: An Approach to Generate Disentangle Representation of Sign Language using InfoGAN**,” 2020 IEEE Region 10 Symposium (TENSYP), Dhaka, Bangladesh, 2020, pp. 1383-1386, doi: 10.1109/TEN-SYMP50017.2020.9230946. 
- Shithi Maitra, Nasrin Akter, Afrina Zahan Mithila, **Tonmoy Hossain**, and Mohammad Shafiul Alam, “**Apriori-backed Fuzzy Unification and Statistical Inference in Feature Reduction: An Application in Prognosis of Autism in Toddlers**”, Accepted in 5<sup>th</sup> International Conference on Advanced Computing and Intelligent Engineering (ICACIE 2020), Mauritius.
- **Tonmoy Hossain**, Fairuz Shadmani Shishir and Faisal Muhammad Shah, “**A Novel Approach to Classify Bangla Sign Digits using Capsule Network**,” 2019 22<sup>nd</sup> International Conference on Computer and Information Technology (ICCIT 2019), Dhaka, Bangladesh, 2019, pp. 1-6, doi: 10.1109/ICCIT48885.2019.9038609. 

- **Tonmoy Hossain**, Fairuz Shadmani Shishir, Mohsena Ashraf, MD Abdullah Al Nasim and Faisal Muhammad Shah, **"Brain Tumor Detection Using Convolutional Neural Network,"** 2019 1st International Conference on Advances in Science, Engineering and Robotics Technology (ICASERT 2019), Dhaka, Bangladesh, 2019, pp. 1-6, doi: 10.1109/ICASERT.2019.8934561. 
- Shithi Maitra, **Tonmoy Hossain**, Abdullah Al-Sakin, Sheikh Inzamamuzzaman, Md. Mamun Or Rashid, Syeda Shabnam Hasan (2019). **"A Gender-Neutral Approach to Detect Early Alzheimer's Disease Applying a Three-layer NN"**. *International Journal of Advanced Computer Science and Applications*. 10. 10.14569/IJACSA.2019.0100368. 
- Faisal Muhammad Shah, **Tonmoy Hossain**, Mohsena Ashraf, Fairuz Shadmani Shishir, MD Abdullah Al Nasim, Md. Hasanul Kabir. **"Brain Tumor Segmentation Techniques on Medical Images - A Review"**, *International Journal of Scientific & Engineering Research*, Volume 10, Issue 2, February-2019. ISSN 2229-5518 
- Shithi Maitra, **Tonmoy Hossain**, Abdullah Al-Sakin and Faisal Muhammad Shah, **"Artificial Prognosis of Cardiac Disease using an NN: A Data-scientific Approach in Outlier Handling,"** 2019 4th International Conference on Electrical Information and Communication Technology (EICT), Khulna, Bangladesh, 2019, pp. 1-12, doi: 10.1109/EICT48899.2019.9068847. 

## Standardized Test Scores

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- Test of English as a Foreign Language (TOEFL)  
Reading – 24 | Listening – 25 | Speaking – 23 | Writing – 26 (Total – 98)

## Academic Projects

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- Optimal Location Detection for a Food Restaurant
- Text Extraction from Images using a modified OCR algorithm
- Segmentation of Brain Tumor using Image Processing Techniques
- Melitus Detector
- Diabetes Prediction
- Supershop Management System

## Awards & Achievements

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- "Dean's List of Honor" (based on B.Sc. result)
- 7<sup>th</sup> Place out of 200 students in the Inter University Math Olympiad 2019
- **Best Paper Award** in *The 11th Annual IEEE Information Technology, Electronics and Mobile Communication Conference* (IEEE-IEMCON 2020)
- Undergraduate admission sub-committee member of Fall-2019 semester at Ahsanullah University of Science and Technology
- IT Support Subcommittee member at the 23<sup>rd</sup> International Conference on Computer and Information Technology (ICCIT - 2020)

## Technical Skills

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**Languages:** Python, C, C++, C#, JAVA, HTML5, PHP, XML, JavaScript, .net, 80x86 Assembly  
**Framework:** CSS, OpenGL  
**Database:** MySQL, SQLite, Oracle

**Design Tools:** NetBeans, Microsoft Visual Studio, PyCharm  
**Operating System:** Windows, LINUX, Android  
**Hardware:** ATMEL (AVR Programming)  
**Deep Learning Tools:** Keras, PyTorch, TensorFlow  
**Others:** PL/SQL, LaTeX

## Presentation & Workshop

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- Presented a paper on 2020 IEEE Region 10 Symposium (TENSYP), Dhaka, Bangladesh
- Presented a paper on 4<sup>th</sup> International Conference on Electrical Information and Communication Technology (EICT 2019), Khulna, Bangladesh
- Presented a paper on 22<sup>nd</sup> International Conference on Computer and Information Technology (ICCIT 2019)
- Presented a paper on 1<sup>st</sup> International Conference on Advances in Science, Engineering and Robotics Technology (ICASERT 2019)
- Participated in "How Computer Program Works", organized by Innovation for Poverty Action associated with University of California, San Diego and Cornell University.

## Reference

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### **Kazi A Kalpoma, PhD**

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### **Mohammad Shafiul Alam, PhD**

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