

RESEARCH INTERESTS

- Deep Learning
- Machine Learning
- Computer Vision
- Data Mining

EDUCATION

- Master of Science in Electrical and Electronic Engineering** (Ongoing) April 2017 - May 2019(Expected)
Bangladesh University of Engineering and Technology (BUET), Dhaka
CGPA: 3.75/4.00, Completed: 18 credits
- Bachelor of Science in Electrical and Electronic Engineering** April 2012 - February 2017
Bangladesh University of Engineering and Technology (BUET), Dhaka
CGPA: 3.78/4.00, 157.5 credits

WORK EXPERIENCE

- Machine Learning Researcher**, Semion Ltd., Dhaka March, 2017 - present
- Providing Deep Learning solutions to potential clients
 - Reproducing state of the art results from the literatures and applying them to proprietary datasets
 - Design and development of necessary software infrastructures, Android app, Alexa skill
- Intern**, Semion Ltd., Dhaka August, 2016 - December, 2016

ONGOING RESEARCHWORKS

- **Deep learning based Sepsis screening system from EHR data**
Detection and prediction (4 hours before the onset) of 3 categories of sepsis by novel deep learning algorithm that uses only six widely available vital measurements; feature ranking and affect of variable number of vital signs
- **Classify subcellular protein patterns in human cells** 🔄
Multi label classification of mixed protein patterns from 4-channel (RGBY) confocal microscopy images, explore the effects of adaptive learning rate and different image processing techniques

RESEARCH ARTICLES ([R⁶](#))

- [1] **A. Mitra**, K. Ashraf. "Sepsis Prediction and Vital Signs Ranking in Intensive Care Unit Patients", *arXiv preprint arXiv:1812.06686*, 2018 📄
- [2] R. Ahsan, **A. Mitra**, S. Omar, M. Z. R. Khan, M. A. Basith. "Sol-gel synthesis of DyCrO₃ and 10% Fe-doped DyCrO₃ nanoparticles with enhanced photocatalytic hydrogen production abilities", *RSC Advances*, 2018 📄
- [3] **A. Mitra**, T. Mostafiz, R. Ur Rashid. "Photoplay: An Android Application to Stimulate Children's Cognitive Development", *IEEE Region 10 Humanitarian Technology Conference (R10-HTC)*, 2017 📄 🔄

UNDERGRADUATE THESIS

- Sol-gel synthesis of DyCrO₃ and 10% Fe-doped DyCrO₃ nanoparticles and characterization of their structural, optical, magnetic properties for enhanced photocatalytic activities**
DyCrO₃ and 10% Fe-doped DyCrO₃ nanoparticles, synthesized by sol-gel method, were characterized using XRD, SEM and UV-visible spectrophotometry. The doped nanoparticles show a reduced band gap (2.45 eV) compared to the undoped ones (2.8 eV). Photocatalytic degradation test shows 17% improved photocatalytic ability for the doped nanoparticles.
Supervisor: Md. Ziaur Rahman Khan, PhD, Department of Electrical and Electronic Engineering(EEE), BUET

SELECTED PROFESSIONAL PROJECTS

- **SemSepsis**, a sepsis detection GUI (Python, PyQt4) 2018
- **SemRad**, a Teleradiology Solution (Java, JavaFX, SQLite, MySQL) 2018
- **Faulty semiconductor wafer detection** from machine logs (Python, Tensorflow) 2018
- **Finding hotspots** in semiconductor wafer logs using LRP algorithm (C++, Python) 2018
- **HealthGeek**, an Android app and **Differential Diagnoses**, an amazon Alexa skill (Java, Node.js, Flask) 2017
- **Risk factors detection** for heart diseases in diabetic patients using bi-LSTM and CRF (Python, Theano) 2017
- Symptoms to disease, organ/body part and specialist **mapping** (Python, R) 2017

SELECTED OTHER PROJECTS

- Retinal Vessel segmentation via ANN, SVM and CNN Self 2018
- Implementation of GTA and ADDA for VisDA-2018 challenge on Syn2Real dataset Self 2018
- End-to-end speech recognition using Baidu's DeepSpeech architecture Self 2018
- Detection of Arrhythmia based on DWT using ANN, SVM and RF Biomedical Signal Processing 2018

• Gate level design, cell layout and simulation of a 3-bit Multiplier	VLSI II Laboratory 2017
• Hangman for GRE, an android app for GRE students	self 2017
• Gate level design and simulation of an 8-bit Microprocessor (Modified SAP)	Microprocessor Laboratory 2016
• Gesture based pong game implementation on a TFT display	Control System Laboratory 2016
• Home security system via push message service	Communication Laboratory 2016
• Gate level design and simulation of a 4-bit Arithmetic Logic Unit	Digital Electronics Laboratory 2015

RELEVANT COURSES

Undergrad Level: Linear Algebra • Probability and Statistics • Calculus I • Calculus II • Ordinary and Partial Differential Equations • Digital Signal Processing I • Continuous Signals and Linear Systems • Digital Logic Design

Grad Level: Biomedical Signal Processing

Self-taught: Machine Learning (Coursera/Stanford) • Convolutional Neural Networks for Visual Recognition (Stanford)

• Deep Learning Specialization-5 courses (deeplearning.ai/Coursera)

SKILLS

Programming Languages: Python, Java, C, C++, MATLAB, Verilog HDL, R, Assembly language

Machine Learning Frameworks: Tensorflow, Keras, Scikit-learn, Pytorch, Theano

Design Tools: PSPICE, Cadence Virtuoso, Proteus, Quartus

IDEs: Android studio, Visual Studio, PyCharm, IntelliJ IDEA, Brackets, Arduino



Other Expertise: Weka, Latex, Git, Microsoft Office

Os: Linux, Windows

ACADEMIC HONORS

Dean's List Award	Awarded for attaining CGPA greater than 3.75
Board Scholarships	At Primary, Junior, Secondary and Higher secondary Levels
Admission Test Scholarship	For securing 83 rd position among 9000 applicants in BUET admission

OTHER ACTIVITIES

355st among 3234 teams (Top 11%), TGS Salt Identification challenge, Kaggle 	2018
12th among 57 teams (Top 21%), Bengali Handwritten Digit Recognition, Kaggle 	2018
2nd Runner up, Inter University Project Show, BUET	2015
1st Runner up, Inter School & College Science Festival, Rajuk College, Dhaka	2010
Volunteer – EEE day 2017 and RAG Program 2017, BUET	2016
Club Affiliations – Satyen Bose Science Club, BUET Robotics Society	

REFERENCES

Dr. Mohammad Ariful Haque
Professor, Department of EEE
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Dr. Khalid Ashraf
Founder, Semion Ltd.
Co-founder, Deepscale Inc.
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