Tusher Chandra Mondol

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RESEARCH INTEREST

Artificial Intelligence, Machine Learning, Deep Learning, Deep Reinforcement Learning and Natural Language Processing.

EDUCATION

Khulna University of Engineering & Technology **Khulna, Bangladesh**
BSc in Computer Science and Engineering *March, 2015-March, 2019*
CGPA: 3.25/4.00
CGPA of last 3 semesters: 3.54

APTITUDE TEST SCORES

- **GRE: 321** *July 25, 2019*
  Quantitative Reasoning: 168 (93 percentile), Verbal Reasoning: 153 (60 percentile), Analytical Writing: 3 (60 percentile).

LANGUAGE PROFICIENCY

- Bengali: **Native** *September 1, 2019*
- English: **Fluent** (**TOEFL iBT Test Scores**: Reading 28, Listening 27, Speaking 20, Writing 25; **Total: 100**)

KEY SKILLS

Programming Language	Python, Java, C, C++
Data-Analysis	Scikit-learn, PyTorch Kears, TensorFlow.
Web Based Language	HTML, CSS, PHP Ajax, XML
DBMS	Oracle, MySQL
IDE	Anaconda, CodeBlocks
Software Packages	CISCO Packet Tracer
Operating System	Windows, Ubuntu

PUBLICATIONS

- **Tusher Chandra Mondol**, Hasib Iqbal, MMA Hashem.
  "Deep CNN-Based Ensemble CADx Model for Musculoskeletal Abnormality Detection from Radiographs"
  Accepted in 5th International Conference on Advances in Electrical Engineering (ICAEE 2019).
- Saifuddin Mahmud, **Tusher Chandra Mondol**, Hasib Iqbal, Alfred Shaker.
  "An Automated Toll Collection System for Bangladesh: An Experimental Approach"
  Published in the 2019 Florida Conference for Recent Advances in Robotics (FCRAR) Proceedings.

RESEARCH EXPERIENCE

"Deep CNN-Based Ensemble CADx Model for Musculoskeletal Abnormality Detection from Radiographs" *May 2018-Dec 2019*

- It is my **undergraduate thesis**. The main goal of this research is to develop a computer-aided diagnosis (CADx) model that will help the doctors to identify musculoskeletal abnormalities through

radiographs. Our proposed technique tested on a benchmark radiographic dataset named 'MURA'.

- This research finds out the various suitable benchmark architectures (VGG-19, ResNet, DenseNet) efficiency to detect musculoskeletal abnormalities in radiograph and leads to propose a hybrid supervised machine learning approach.
- This Hybrid approach generates .729, .644, .743, and .753 in terms of Cohen's Kappa Statistics respectively for Elbow, Finger, Humerus, and Wrist which is relatively better than other classifiers in terms of performance metrics.

"Deep Neural Networks based Non-Invasive Blood Components Level Measurement from Fingertip Video" *Feb 2018-July 2018*

- The main goal of this research is to propose a new non-invasive, and convenient method with the motive of measuring blood components level (Hemoglobin, Glucose, Hemoglobin--A1C, and Creatinine) using Photoplethysmogram (PPG) characteristics features which are extracted from fingertip videos.
- We have made a complete dataset, what is used in this research.
- Genetic Algorithm (GA) was used to select best features and finally a Deep Neural Networks (DNNs) model was developed to measure blood components level.
- This approach estimates the accuracy of ±0.243 gm/dL (R = 0.940), ±0.237 mmol/L (R = 0.975), ±0.112 (%) (R = 0.949), and ±0.031 mg/dL (R = 0.939) respectively for Hemoglobin, Glucose, Hemoglobin A1C, and Creatinine.

PROJECTS

(All projects can be found here)

Traffic Sign Detection System *March 2018-April 2018*

- The main goal of this project is to recognize road signs by ML. 5 hidden layer CNN, Max pooling, SGD optimizer, VALID padding was used for this purpose. Number of epochs was 30, Learning rate was .0001.

Gesture based Bangla Numerical Digit Classification *July 2017-Aug 2017*

- Objective of this project was to develop a system that can recognize numerical digits based on hand gestures.
- Several morphological image processing techniques, Data visualization techniques, 2 deep learning architectures (VGG16, Inception-V3), 2 optimizers (Adam, RMSprop), 10 epochs with early stopping of patience 3 were applied.
- Accuracy in average was 85.61% for 10 classes.

Sing Language based Bengali Character Classification *July 2017-Aug 2017*

- Objective of this project was to develop a system that can recognize numerical digits based on hand gestures.
- Data visualization techniques, 10 hidden layer CNN, Max pooling, SGD optimizer
- Accuracy in average was 84.9% for 36 classes.

Secured Automated Toll Collection System *Nov 2017-April 2018*

- It is a Raspberry Pi based system concerned with fully automated toll collection system using RFID tags with privacy preserving mutual authentication system.
- It has a website that works as a bridge between authority and citizens.

Library Management System *Sept 2017 – Oct 2017*

- This website helps to manage daily activities of a library.
- It helps to check available books, take books as loan, check fine, check abilities of a student to take loan, total amount of loans in a day.

Alumni Association Management System *Nov 2017 – Feb 2018*

- A web platform to manage alumni association of a university.

Digital Class *June 2016 – Sept 2016*

- An android platform to manage regular class activities.

Avoid crash *Nov 2018 –Dec 2019*

- A 3D computer graphics game developed through OpenGL.

COMPETITIVE PROGRAMMING

Online Contest

§ Codeforces Handle: tusher_002 (Around 126 problem solved).
§ HackerRank Handle: Tusher Mondol

Onsite Contest

§ Intra Department Programming Contest, 2015 (arranged by CSE association, KUET).
§ Team Forming Contest, 2015; 2016 (arranged by SGIPC, KUET).
§ Intra KUET Programming Contest, 2016 (arranged by SGIPC, KUET).
§ National Programming Contest, Cybernauts 2016 (arranged by CSE club)
§ Inter University Programming Contest, 2016 (arranged by Det. of CSE, BUET)

MENTORING EXPERIENCE

SGIPC, KUET *May 2016 – April 2017*

§ Conducted workshops in developing problem-solving basics including C programming for the Undergraduate students.

HACK, KUET *June 2017 – July 2018*

§ Conducted workshops in developing embedded system based on Raspberry Pi, Arduino for the Undergraduate students.

ONLINE COURSES & ATTENDED SEMINARS

§ Machine Learning by Stanford University (Hosted by Coursera).
§ Neural Networks and Deep Learning (Hosted by deeplearning.ai).
§ Bangla Language Remembrance Project in Information Technology through Research and Development (Arranged by ICT Division, Bangladesh. Hosted by KUET).

AWARDS AND ACHIEVEMENTS

§ **Champion** in University Day Project Showcasing, 2017, organized by KUET.
§ **Champion** in Intra Department Idea Contest, 2017, organized by CSE association, KUET.
§ **2nd** in System Development Project, 2017, organized by Department CSE, KUET.
§ **5th** in Intra KUET Programming Contest, 2016, organized by SGIPC, KUET.
§ Scholarship from Chevron International REACH Scholarship Program.
§ Vocational Scholarship from Khulna University of Engineering and Technology (2015-2018).

LEADERSHIP & VOLUNTARY ACTIVITIES

§ Vice President, CSE association, KUET.
§ Vice President, Special Group Interested in Programming Contest (SGIPC), KUET.
§ General Secretary, Hardware Acceleration Club of KUET (HACK), KUET.
§ General Secretary, Dream (blood donating organization), KUET.
§ Chief Organizer, Youth Summit (2017, 2018), KUET.
§ Organizer, National High School Programming Contest, Khulna Zone (2015, 2016, 2017).

REFERENCES

§ **Dr. M.M.A Hashem**
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