

ABDUL MUNTAKIM RAFI

LinkedIn: 

Google Scholar: 

GitHub: 

ResearchGate: 

RESEARCH INTERESTS

Computational biology, Biomedical image processing, Digital image forensics, Activity Recognition, Sign2Text translation, Social network data analysis, Machine learning, Deep learning, Signal processing algorithms

EDUCATION

DOCTOR OF PHILOSOPHY IN BIOMEDICAL ENGINEERING

2021 - PRESENT

University of British Columbia

Vancouver, Canada

SUPERVISOR: Dr. Carl de Boer, Assistant Professor, School of Biomedical Engineering

MASTER OF APPLIED SCIENCE IN ELECTRICAL AND COMPUTER ENGINEERING

2019 - 2021

University of Windsor

Windsor, Canada

SUPERVISOR: Dr. Q. M. Jonathan Wu, Professor, Department of Electrical and Computer Engineering

BACHELOR OF SCIENCE IN ELECTRICAL AND ELECTRONIC ENGINEERING (EEE)

2014 - 2018

Bangladesh University of Engineering and Technology (BUET)

Dhaka, Bangladesh

SUPERVISOR: Dr. Md. Kamrul Hasan, Professor, Department of EEE

JOB & RESEARCH EXPERIENCE

- Graduate Teaching Assistant** Sep 2021 -
 Master of Data Science, University of British Columbia
 Joined UBC's Master of Data Science program as a full time teaching assistant for the Fall 2021 term. Courses I will work as a TA here are Data Science Workflows, Algorithms and Data Structures, and Computing Platforms for Data Science.
- Graduate Research Assistant, de Boer Lab.** de Boer Lab May 2021 -
 We are a mixed computational/experimental group located in the School of Biomedical Engineering at the University of British Columbia in Vancouver, Canada. My task is to apply machine learning to decipher gene regulation.
- Graduate Academic Assistant, School of Biomedical Engineering, UBC.** de Boer Lab Apr 2021 - Apr 2021
 Joined de Boer Lab a month before starting my Ph.D. as a graduate academic assistant.
- Mitacs Accelerate Intern, Lanner Electronics Inc.** lanner Nov 2020 - Mar 2021
 Joined Lanner through the Mitacs Accelerate, which is Canada's premiere research internship program. Here, I am working on efficient inference of different AI-driven applications in edge devices.
- Graduate Teaching Assistant** Jan 2020 - Dec 2020
 Department of Electrical and Computer Engineering, University of Windsor
 Worked as a graduate teaching assistant of the courses 'Engineering Software Fundamentals' and 'Computational Intelligence'. In 'Engineering Software Fundamentals', I taught the basics of programming using C++. In 'Computational Intelligence', I created guidelines for projects on stacked autoencoder, variational autoencoder, and reinforcement learning.
- Research Assistant, Centre for Computer Vision and Deep Learning** Aug 2019 - Mar 2021
Supervisor: Prof. Dr. Jonathan Wu, Department of Electrical and Computer Engineering, University of Windsor
 Pursued my Masters in Applied Science degree from this lab under the supervision of Professor Dr. Jonathan Wu.
- Deep Learning Engineer, IFIVEO.** i-50 Oct 2019 - Apr 2020
 Joined ifiveo through the Mitacs Accelerate. Here, my task has been to perform activity recognition in order to measure and improve manufacturing floor production processes using deep learning based vision systems. I have collected data from manufacturing floors, supervised the annotation process, and deployed deep learning models using Amazon Sagemaker.
- Machine Learning Engineer, REVE Systems Ltd.** Mar 2019 - July 2019
 Worked on designing a real-time Sign2Text translator for Bangla Sign Language.
- Research Assistant, Digital Signal Processing Research Laboratory, BUET** Oct 2018 - Mar 2019
Supervisor: Prof. Dr. Md. Kamrul Hasan, Department of Electrical and Electronic Engineering, BUET
 Did my undergrad thesis under the supervision of Professor Dr. Md. Kamrul Hasan from this lab. After graduation, I joined the lab as a Research Assistant. I published a paper in CVPR and participated in two international signal processing competitions during my time in the lab.

ENGINEERING PROJECTS

- Understanding Global Reaction to the Recent Outbreaks of Coronavirus** Analysis of Instagram posts 2020
 to understand public reaction to the outbreak of Coronavirus for Social Network Data Analysis course project.

- **Performance of GANs on Noisy Labels** Analysis and Implementation of label noise robust GANs on noisy labels for Applied Machine Learning course project. 2020
- **Missing Data Imputation:** Implementation and improvement of Data Imputation under Similarity Rule Constraints for Data Mining course project. 2019
- **Understanding Clouds from Satellite Images:** Classification and segmentation of different types of clouds from satellite images for Deep Learning course project. 2019
- **Bangla Sign Language Alphabet Recognition:** Bangla Sign Language Alphabet Recognition Using Convolutional Neural Network for Biomedical Instrumentation term project. 2018
- **Automated Shooter Bot:** Design and hardware implementation of a shooter bot using Haar features on Raspberry Pi for Control System term project. 2018
- **Amplitude Modulator/Demodulator:** Design and circuit implementation of amplitude modulation and demodulation for Communication Theory term project. 2017
- **Transmission Line Fault Detection:** Detection of fault type and fault location in power transmission lines using Arduino for Microprocessor and Interfacing term project. 2017
- **Measurement of BPM:** Calculation of BPM from a noisy ECG signal using MATLAB for Digital Signal Processing term project. 2017
- **Automatic Traffic Signal System** Design and implementation of four-way traffic signal using logic gates for Digital Electronics lab project. 2016
- **Bidirectional Visitor Counter** Design and hardware implementation of automatic room light controller with bidirectional visitor counter using Arduino for Electronics laboratory 2016
- **Controlling Inductive Loads Using Triacs** Design and hardware implementation of Triacs for controlling inductive loads using ATmega 32 for Electrical Circuits Laboratory term project. 2015

RELEVANT COURSES TAKEN

- **MSc:** Data Mining (94%), Deep Learning (93%), Applied Machine Learning (90%), Social Network Data Analysis (90%)
- **BSc:** Digital Signal Processing (A+), Computer Programming (A+), Ordinary and Partial Differential Equations (A+), Random Signals and Processes (A)

LIST OF PUBLICATIONS

- **Abdul Muntakim Rafi**, Thamidul Islam Tonmoy, Uday Kamal, Q.M. Jonathan Wu, Md. Kamrul Hasan, “RemNet: Remnant Convolutional Neural Network for Camera Model Identification”, published in **Neural Computing And Applications (IF: 5.606)** [SpringerLink]
- **Abdul Muntakim Rafi**, Uday Kamal, Rakibul Hoque, Abid Abrar, Sowmitra Das, Robert Laganieri, Md. Kamrul Hasan, “Application of DenseNet in Camera Model Identification and Post-processing Detection”, presented in **The IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2019, pp. 19-28**, Long Beach, CA, USA, June 2019 [CVPR 2019 open access]
- **Abdul Muntakim Rafi**, Nowshin Nawal, Nur Sultan Nazar Bayev, Lusain Nima, Celia Shahnaz, Shaikh Anowarul Fattah, “Image-based Bengali Sign Language Alphabet Recognition for Deaf and Dumb Community”, presented in **2019 IEEE Global Humanitarian Technology Conference (GHTC)**, Seattle, WA, USA, October 2019 [IEEEExplore]
- **Abdul Muntakim Rafi**, Jonathan Wu, Md. Kamrul Hasan, “L2-Constrained RemNet for Camera Model Identification and Image Manipulation Detection”, presented in Advances in Image Manipulation workshop and challenges on image and video manipulation in conjunction with **ECCV 2020**, August 2020 [SpringerLink]
- **Abdul Muntakim Rafi**, Shivang Rana, Rajwinder Kaur, Jonathan Wu, Pooya Moradian Zadeh, “Understanding Global Reaction to the Recent Outbreaks of COVID-19: Insights from Instagram Data Analysis”, accepted at **IEEE International Conference on Systems, Man, and Cybernetics, 2020**, October 2020 [IEEEExplore]
- Uday Kamal, **Abdul Muntakim Rafi**, Rakibul Hoque, Jonathan Wu, Md. Kamrul Hasan, “Lung Cancer Tumor Region Segmentation Using Recurrent 3D-DenseUNet”, accepted at The Second International Workshop on Thoracic Image Analysis in conjunction with **MICCAI 2020**, October 2020 [SpringerLink]

OTHER SCHOLARLY ACTIVITIES

- Reviewer of *Neurocomputing* by Elsevier [IF: 5.719]
- Reviewer of *Journal of Real-Time Image Processing* by Springer [IF: 2.358]
- Reviewer of *Cyber-systems and Robotics* by IET

SKILLS

- **Programming Languages:** Python (Advanced), MATLAB (Advanced), C++ (Intermediate), C (Intermediate), Assembly(Intermediate), Verilog (Basic)
- **Machine learning and deep learning libraries:** Pytorch, Keras, tensorflow, MXNet, Pandas, OpenCV, Matplotlib, Numpy, Scipy, Seikit-learn

- **Deep learning inference:** Amazon SageMaker, Intel OpenVINO, Nvidia TensorRT
- **Cloud Computing:** Amazon Web Services (AWS), AWS SageMaker, Amazon ECS, Amazon Kinesis, Amazon S3
- **Simulation & Design Tools:** OrCAD PSpice, Cadence EDA Tools (Virtuoso), Proteus7, Auto-CAD, emu8086, AVRstudio, CYME PSAF, Adobe Illustrator
- **Typesetting Software:** L^AT_EX(Advanced)
- **Operating Systems:** Windows (Advanced), Ubuntu (Advanced), Windows Server 2012(Intermediate)
- **Graphic Design:** Adobe illustrator (Advanced), Adobe Photoshop (Intermediate), Adobe Premiere Pro(Intermediate)
- **Languages:** English (Advanced), Bengali (Native), Hindi (Intermediate)
- **Soft Skills:** Adaptability, Ability to work under pressure, Hardworking, Dedication, Teamwork

AWARDS AND SCHOLARSHIPS

- **Four Year Doctoral Fellowship (4YF)** [UBC 4YF]
The Four Year Doctoral Fellowship (4YF) program ensures UBC's best Ph.D. students are provided with financial support plus tuition for up to four years of their doctoral studies.
- **SBME Graduate Support Initiative-Entrance Award** [UBC GSI]
This one-time award is granted to top-ranked incoming Ph.D. students, or top-ranked Ph.D. students in the first year of their program in SBME.
- **IEEE SPS Video and Image Processing Cup 2018** [IEEE SP Magazine]
Member of the team that won **2nd** place among 28 teams from the whole world.
- **4th IEEE-WIECON-ECE 2018 Humanitarian Project Competition** [IEEE SIGHT BLOG]
Member of the team that placed **2nd** among top 8 teams.
- **IEEE Signal Processing Cup 2018**
Participant.
- **Bangladesh Math Olympiad**
National : 2nd Runners Up(2006) Divisional: Champion(2006, 2011,2012,2013), 2nd Runners Up(2010)
- **Bangladesh Science Olympiad**
National: 3rd(2011) Divisional: 3rd(2010) , 1st(2011)
- **Bangladesh Astro Olympiad**
National: 4th(2012) Divisional: 2nd(2012)
- **Bangladesh Physics Olympiad**
Divisional: Champion(2012)

ACHIEVEMENTS AND EXTRACURRICULAR ACTIVITIES

- **Secretary**, *Biomedical Engineering Graduate Association*, University of British Columbia 2021-
- **Graduate Student Rep**, *SBME Sustainability Committee*, University of British Columbia 2021-
- **Assistant Treasurer** *IEEE Joint Chapter SP/COM, IEEE Windsor Section*, University of Windsor 2020-2021
- **Vice President**, *Satyen Bose Science Club*, BUET 2017 - 2018
- **Assistant General Secretary** *Satyen Bose Science Club*, BUET 2017
- **Audited Online Courses:** Deep Learning Specialization [Coursera]. CS156 Machine Learning Course [Caltech], CS231n Convolutional Neural Networks for Visual Recognition [Stanford University]

CONFERENCES & WORKSHOPS

- The Second International Workshop on Thoracic Image Analysis in conjunction with MICCAI 2020 Oct 2020
Lima, Peru
- Advances in Image Manipulation workshop and challenges on image and video manipulation in conjunction with ECCV 2020 Aug 2020
Glasgow, UK
- 2018 IEEE International Conference on Image Processing Oct 2018
Athens, Greece

STANDARDIZED TESTS

- **TOEFL iBT:** 104/120; R: 29, L: 23, S: 24, W: 28

REFERENCES

- **Dr. Carl de Boer**
Assistant Professor
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University of British Columbia, Canada

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- **Dr. Q. M. Jonathan Wu**

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University of Windsor, Canada
Email: **jwu@uwindsor.ca**

- **Dr. Md. Kamrul Hasan**

Professor and Head of Department
Department of Electrical and Electronic Engineering
Bangladesh University of Engineering and Technology, Dhaka, Bangladesh
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- **Dr. Jie Huo**

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