

# Shahed Ahmed

## Curriculum Vitae

R-913(A), ECE Building, West Palashi  
Dept. of Electrical and Electronic Engineering  
BUET, Dhaka, Bangladesh

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## Education

MSc, Electrical and Electronic Engineering 2021-2023  
Bangladesh University of Engineering and Technology (BUET)  
CGPA: 4.00/4.00, Relevant courses: Biomedical Signal Processing, Digital Image Processing,  
Machine Learning and Pattern Recognition, Deep Learning

BSc, Electrical and Electronic Engineering 2016-2021  
Bangladesh University of Engineering and Technology (BUET)  
CGPA: 3.96/4.00, Class Rank: 2/215 (Top 1%)  
Relevant courses: Digital Signal Processing I and II, Random Signals and Processes

## Work Experience

Lecturer, Dept. of Electrical and Electronic Engineering 08/2021-Ongoing  
Bangladesh University of Engineering and Technology (BUET)

## Research Experience

**Digital Signal Processing Research Lab, BUET** 04/2019-08/2023  
Supervisor: Prof. Md. Kamrul Hasan

- Developed deep learning models with novel signal processing inspired ideas to achieve generalized medical image segmentation across diverse medical imaging modalities such as ultrasound, optical, X-ray etc.
- Developed the first deep learning based approach for Ultrasound Shear Wave elasticity imaging. A large volume of simulated phantom data was generated in COMSOL Multiphysics for training purpose. The trained model was tested on real world CIRS phantom data with good reconstruction performance.

**EuProw Research Lab, BUET** 08/2021-08/2022  
Supervisor: Prof. Shaikh Anowarul Fattah

- Developed a novel neural network with computation-efficient non-local blocks to achieve high accuracy in three separate nuclei segmentation datasets (MoNuSeg, TNBC, and Data Science Bowl-2018). A manuscript on the above work is currently being reviewed at a reputed journal.
- Formulated a deep learning model with a speech enhancement preprocessing block for robust sound source localization. The model demonstrated satisfactory localization performance on the open source DREGON dataset.

## Skills

Programming: C/C++, MATLAB, Python, Latex, Verilog  
Software and Tools: Pytorch, Tensorflow, Git, Illustrator, COMSOL, Spice, Keil uVision, 3D Slicer  
Languages: English, Bengali

## Selected Publications

1. **Shahed Ahmed**, Md Kamrul Hasan. "Twin-SegNet: Leveraging Foreground and Background Focused Segmentation Networks through Image Reconstruction with Partial Channel Recalibration." *In Review*
2. **Shahed Ahmed**, Beig Rajibul Hasan, Shaikh Anowarul Fattah, Mohammad Saquib. "CAB-SegNet: A Context Aware Boundary Preserving Dual-Stage Network for Accurate Nucleus Segmentation." *In Review*
3. **Shahed Ahmed**, Md Kamrul Hasan. "COMA-Net: Towards generalized medical image segmentation using complementary attention guided bipolar refinement modules." *Biomedical Signal Processing and Control*, 86, p. 105198, 2023
4. Md Jahin Alam, Mir Sayeed Mohammad, Md Adnan Faisal Hossain, Ishtiaque Ahmed Showmik, Munshi Sanowar Raihan, **Shahed Ahmed**, Talha Ibn Mahmud. "S2C-DeLeNet: A parameter transfer based segmentation-classification integration for detecting skin cancer lesions from dermoscopic images." *Computers in Biology and Medicine*, 150, p. 106148, 2022
5. **Shahed Ahmed**, Md Tariqul Islam, Soumav Biswas, Rayhan Hayther Samrat, Tafhimul Islam Akash, Arik Subhana, Celia Shahnaz. "CapNet: A Deep Learning-based Framework for Estimation of Capnograph Signal from PPG." *2022 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, pp. 3392-3395, IEEE, 2022
6. Nabila Tasnim, Joyita Halder, **Shahed Ahmed**, Shaikh Anowarul Fattah. "An Approach for Analyzing Cognitive Behavior of Autism Spectrum Disorder Using P300 BCI Data." *2022 IEEE Region 10 Symposium (TENSYP)*, pp. 1-6, IEEE, 2022
7. **Shahed Ahmed**, Uday Kamal, Md. Kamrul Hasan. "DSWE-Net: A deep learning approach for shear wave elastography and lesion segmentation using single push acoustic radiation force." *Ultrasonics*, 110, p. 106283, 2021

## Teaching and Mentorship

- Taught the following undergraduate theory courses: *Digital Signal Processing-I*, *Digital Signal Processing-II*, *Fundamentals of Electrical Engineering*
- Prepared lab materials for and also taught the following laboratory courses: *Microprocessor and Embedded Systems Laboratory*, *Artificial Intelligence and Machine Learning Laboratory*, *Digital Signal Processing-I Laboratory*, *Biomedical Signals*, *Measurement and Instrumentation Laboratory*
- Mentored several groups of undergraduate students with their projects in the *Biomedical Signals*, *Measurement and Instrumentation Laboratory* and *Digital Signal Processing-I Laboratory* courses. Some of these projects have resulted in publications at reputed journals/conferences.

## Honors and Awards

- BUET undergraduate merit scholarship for 8 consecutive semesters (2016-2021)
- Dean's List Award in 4 consecutive years at BUET (2016-2021)
- Huawei academic scholarship (2017)

## Professional Affiliations and Activities

- Institute of Electrical and Electronics Engineers (IEEE) membership, 06.2020-current
- IEEE Signal Processing Society membership, 06.2020-current
- IEEE Engineering in Medicine and Biology Society (EMBS) membership, 06.2022-current
- Organizing Committee member, International Conference on Electrical and Computer Engineering, ICECE-2022, Dhaka, Bangladesh
- Member, Bureau of Research, Testing and Consultation (BRTC), BUET, 10.2023-current

## Academic Service

- **Reviewer**, *Biomedical Signal Processing and Control*