Shahed Ahmed

Curriculum Vitae

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

MSc, Electrical and Electronic Engineering, *2021-2023*
Bangladesh University of Engineering and Technology (BUET)
CGPA: 4.00/4.00, Thesis topic: Multi-modal Medical Image Segmentation
Relevant courses: Signal Detection and Estimation, Digital Image Processing, Deep Learning

BSc, Electrical and Electronic Engineering *2016-2021*
Bangladesh University of Engineering and Technology (BUET)
CGPA: 3.96/4.00, Class Rank: 2/216 (Top 1%),
Thesis topic: Ultrasound Shear Wave Elastography using Deep Learning
Relevant courses: Digital Signal Processing I and II, Random Signals and Processes

Work Experience

Lecturer, Dept. of Electrical and Electronic Engineering (EEE) *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 synthetic 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

- An efficient non-local neural network based approach has been developed 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 renowned IEEE journal.
- A neural network based approach with a speech enhancement preprocessing block has been formulated to achieve high accuracy in sound source localization task using a microphone array mounted on an Unmanned Aerial Vehicle (UAV).

Skills

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

Selected Publications

1. **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
2. 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
3. Md Awsafur Rahman**, Shahed Ahmed**, Shaikh Anowarul Fattah. "*A Deep Learning Scheme for Detecting Atrial Fibrillation Based on Fusion of Raw and Discrete Wavelet Transformed ECG Features*." 2022 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), pp. 1024-1027, IEEE, 2022
4. **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
5. 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 (TENSYMP), pp. 1-6, IEEE, 2022
6. **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 (Jul-22)
  - Digital Signal Processing-II (Jul-21)
  - Fundamentals of Electrical Engineering (Jul-21, Jan-22, Jan-23)
- Prepared lab materials for and also taught the following laboratory courses:
  - Microprocessor and Embedded Systems (Jan-21, Jan-22)
  - Biomedical Signals, Measurement and Instrumentation (Jul-21, Jul-22)
- Mentored several groups of undergraduate students with their projects in the Biomedical Signals, Measurement and Instrumentation, and DSP courses. Some of these projects have resulted in publications in reputed journals/conferences.

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
- Technical Committee member, International Conference on Telecommunications and Photonics, ICTP-2021, Dhaka, Bangladesh

Academic Service

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