Nahian Siddique

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EDUCATION

M.S. in Electrical and Computer Engineering
Purdue University, IN, USA *Aug 2019 – Aug 2021*
- **4.00/4.00 GPA**
- **Thesis**: U-net based deep learning architectures for object segmentation in biomedical images.

GRE Quantitative: 169/170 Verbal: 158/170 Analytical Writing: 3.5/6 *Dec 2018*

B.S. in Electrical Engineering
Islamic University of Technology, Bangladesh *Jan 2014 – Nov 2017*

WORK EXPERIENCE

Teaching Assistant | Purdue University, IN, USA *Jan 2020 – Aug 2021*
- Instructed over 30 undergraduate students for Electronic Measurements lab and Signals and Systems lab.
- Created lesson plans, lab manuals, and assignments working in close collaboration with course professors.
- Delivered one-on-one assistance to students during practical sessions and hands-on demonstrations.

Research Assistant | Purdue University, IN, USA *Aug 2020 – May 2021*
- Conducted an extensive literature review of over 300 deep learning applications in biomedical imaging.
- Facilitated the design of novel deep neural networks using Keras and TensorFlow for biomedical image analysis.
- Led the development of machine learning algorithms to predict soil properties using automated machine learning and time series analysis on remotely sensed data.

Software Engineer | Synchronous, Bangladesh *May 2018 – Aug 2018*
- Designed and optimized video broadcast management system to deployment.
- Implemented multiplatform interfacing using React and React Native.
- Identified incompatibility issues and documented system performance.

SKILLS

Languages: Python, MATLAB, R, C++, SQL, JavaScript
Libraries: Keras, PyTorch, TensorFlow, Scikit-Learn, Pandas, Matplotlib, AutoML
Software and Tools: AWS, GCP, Git, Tableau, Apache Hadoop

PROJECTS

Biomedical Image Segmentation – Master's thesis project
- Developed an image segmentation algorithm using U-net based convolutional neural networks.
- Produced state-of-the-art performance on retinal fundus and Dermoscopy image datasets.
- Presented project results at SPIE Defense + Commercial Sensing conference, Apr. 2021.

Soil Moisture Prediction – Research project
- Modeled an artificial neural network to detect soil moisture levels from UAV images.
- Implemented an LSTM model to forecast soil moisture levels from historical data.
- Published research findings in journal Remote Sensing of Environment, Jul. 2021.

Generative Adversarial Network – Machine learning course project
- Built a generative adversarial network (GAN) to synthesize images of handwritten characters and vehicles.
- Streamlined network for easy modification to train and produce images of different objects.

Swarm Intelligence for Data Clustering – Big data course project
- Programmed a chemical reaction inspired swarm optimization for enhanced K-means clustering.
- Deployed and tested the algorithm on AWS for large-scale data clustering.

PUBLICATIONS

[1] E. Babaeian, S. Paheding, **N. Siddique**, V. K. Devabhaktuni, and M. Tuller, "Estimation of root zone soil moisture from ground and remotely sensed soil information with multisensor data fusion and automated machine learning," *Remote Sensing of Environment*, vol. 260, Jul. 2021, Art. no. 112434.

[2] **N. Siddique**, S. Paheding, C. Elkin, and V. K. Devabhaktuni, "U-Net and its variants for medical image segmentation: A review of theory and applications," *IEEE Access*, vol. 9, pp. 82031–82057, Jun. 2021.

[3] **N. Siddique**, S. Paheding, M. Z. Alom, and V. K. Devabhaktuni, "Recurrent residual U-Net with EfficientNet encoder for medical image segmentation," in *Proc. SPIE 11735, Pattern Recognition and Tracking XXXII, 117350L*, Apr. 2021.