

Good morning,  
You are invited to attend our weekly ECE Graduate Seminar.

**Old Dominion University**  
**College of Engineering and Technology**  
**Department of Electrical and Computer Engineering**

All lectures to be held at 3:00pm on Fridays online at [ODU DL: ECE 731 831 Grad Seminar](#)

For more information, contact Dr. Chung Hao Chen at (757) 683-3475 or email [cxchen@odu.edu](mailto:cxchen@odu.edu).

**Friday, October 8, 2021 Seminar Topic:**

**DEEP LEARNING APPROACHES FOR SEAGRASS DETECTION IN MULTISPECTRAL IMAGERY** by Dr. Kazi Islam, Ph.D., Research Assistant Professor in the School of Cybersecurity at Old Dominion University

**Abstract:**

Seagrass is an important factor to balance marine ecological systems, and it is of great interest to monitor its distribution in different parts of the world. Remote sensing imagery is considered an effective data modality based on which seagrass monitoring and quantification can be performed remotely. This talk presents a set of deep learning models for seagrass detection in multispectral satellite images. In supervised learning, we compare a deep capsule network (DCN) with a deep convolutional neural network (DCNN) for seagrass detection in high-resolution multispectral satellite images. In addition, we also propose a few-shot deep learning strategy to transfer knowledge learned by DCN from one location to the others for seagrass detection. Then, we develop a semi-supervised domain adaptation method to generalize a trained DCNN model to multiple locations for seagrass detection. The model achieves the best results in 28 out of 36 scenarios as compared to other state-of-the-art domain adaptation methods. Next, we develop a semantic segmentation method for seagrass detection in multispectral time-series images. First, we train a state-of-the-art image segmentation method using an active learning approach where we use the DCNN classifier in the loop. Then, we develop an unsupervised domain adaptation (UDA) algorithm to detect seagrass across temporal images.

**Bio:**

Kazi Aminul Islam is a Research Assistant Professor at the School of Cybersecurity at Old Dominion University. He recently completed his Ph.D. degree in the Electrical and Computer Engineering department at Old Dominion University, USA. Previously, he received his BS degree in Electrical and Electronic Engineering from Khulna University of Engineering and Technology, Bangladesh, and an MS degree in Electrical Engineering from Lamar University, USA. His research interests include machine learning.