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
https://vs.prod.odu.edu/kvs/zoom/?cid=202120_ECE731831GraduateSeminarSpring2022VS_96353
For more information, contact Dr. Chung Hao Chen at (757) 683-3475 or email cxchen@odu.edu.

Friday, April 22, 2022 Seminar Topic:

"nnUNet-based Multi-modality Breast MRI Segmentation and Tissue-Delineating Phantom for Robotic Tumor Surgery Planning" by Mr. Motaz Alqaoud, PhD Student in the Biomedical Engineering Institute at Old Dominion University

Abstract:
Segmentation of the thoracic region and breast tissues is crucial for analyzing and diagnosing the presence of breast masses. We introduce a medical image segmentation architecture that aggregates two neural networks based on the state-of-the-art nnU-Net. Additionally, this research proposes a polyvinyl alcohol cryogel (PVA-C) breast phantom, based on its automated segmentation approach, to enable planning and navigation experiments for robotic breast surgery. The dataset consists of multimodality breast MRI of T2W and STIR images obtained from 10 patients. A statistical analysis of segmentation tasks emphasizes the Dice Similarity Coefficient (DSC), segmentation accuracy, sensitivity, and specificity. We first use a single class labeling to segment the breast region and then exploit it as an input for three-class labeling to segment fatty, fibroglandular (FGT), and tumorous tissues. The first network has a 0.95 DCS, while the second network has a 0.95, 0.83, and 0.41 for fat, FGT, and tumor classes, respectively.

Bio:
Motaz Alqaoud received his M.S. degree in Biomedical Engineering from the University of New Haven, New Haven, CT, in 2019. He is currently pursuing a Ph.D. degree in Biomedical Engineering with Old Dominion University, Norfolk, VA. Motaz was awarded Excellence in Presentation for the General Sciences & Engineering Track of the Modeling, Simulation, & Visualization Student Capstone Conference in 2021. His research interests include but are not limited to Medical Image Modalities, Surgery Planning, Surgical Navigation, and Machine Learning. Motaz plans to graduate in 2024.