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.

Friday, November 5, 2021 Seminar Topic:

OPTICAL IMAGING FOR MONITORING PECTUS EXCAVATUM THERAPY by Nahom Kidane, Ph.D. Candidate and Adjunct Professor in the Department of Computational Modeling and Simulation at Old Dominion University

Abstract:
Pectus Excavatum (PE) is a congenital chest wall deformity of unknown etiology that becomes more pronounced during early adolescence. PE is often accompanied by other problems such as fatigue, breathing issues, and even scoliosis. Clinical care for PE and other pediatric chest deformities requires computed tomography (CT) to determine the severity and surgical candidacy according to insurance guidelines. Furthermore, chest shape improvements during nonsurgical treatment are challenging to track due to slow chest morphology changes. A non-invasive and objective method of capturing surface anatomy, such as 3D scanning, would be advantageous for evaluating chest wall deformity. By potentially eliminating the need for CT scanning and superseding manual measurements subject to errors, a system that utilizes optical scanning presents great value to patients and practitioners.

We developed an imaging system that uses off-the-shelf 3D scanning technology to obtain optical scans of the pectus deformity and provide metrics over the target area. The tool is utilized to calculate the change in chest shape and generate a heat map for the region of interest quantifying chest wall improvements. This system is currently installed at the Nuss Center clinic at the Children's Hospital of The King's Daughters and underwent several layers of validation studies to infer its functionality. This presentation outlines the development and validation of the proposed Pectus Metric system.

Bio:
Nahome Kidane, M.S. is a Ph.D. candidate and an Adjunct Professor at Old Dominion University's Computational Modeling and Simulation Engineering Department. He received his BS degree in Electrical Engineering from Jimma University, Ethiopia, and his MS degree in Modeling and Simulation Engineering from Old Dominion University, Norfolk, Virginia. His main research areas are medical simulation, 3D deep learning, augmented reality, and scientific visualization. His email address is nkidane@odu.edu.