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, March 18, 2022 Seminar Topic:

"Role of Purkinje-Myocardial Junctions in Arrhythmogenesis in Presence of Long Qt Syndrome Conditions"
by Ms. Vicky Lam, MS student in the Biomedical Engineering Institute at Old Dominion University

Abstract:
Long QT Syndrome (LQTS) is an increasingly studied condition that leads to potentially fatal heart rhythm disorders, called arrhythmias, and sudden cardiac death. The alterations in the electrocardiograms (ECGs) seen in LQTS patients is caused by mutations to genes related to ion channels in cardiac cells. Computational modeling allows the mechanistic study of these ion channel mutations in LQTS by providing quantitative predictors of cardiac behavior in human and rabbit heart models. This work hypothesizes that the repolarization reserve in cardiac Purkinje cells, that form the cardiac conduction system, is lower than that of ventricular myocytes, resulting in a higher propensity of electrophysiological abnormalities in the form of spontaneous activity, particularly early and delayed afterdepolarizations (EADs and DADs, respectively). To investigate this hypothesis, detailed computational methods were created by incorporating experimental data. The computer models were then utilized to reproduce the experimentally observed behavior in single cells as well as 3-dimensional ventricular models. The computational results show more profound effects of the LQTS mutations on action potential duration (APD) prolongation in Purkinje cells when compared to ventricular myocytes. Future research includes determining the effect of these APD differences on the entirety of the heart using an anatomical 3D model of a rabbit heart.

Bio:
I am currently pursuing a M.S. in biomedical engineering, while also working as a research assistant for a cardiac modeling project involving both NSU and ODU. I previously studied Neuroscience at W&M. Outside of my academic pursuits, I am an avid rugby player and love to hike.