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 1, 2022 Seminar Topic:

"In Silico Investigation of Cardiac Arrhythmia Susceptibility in Long QT Phenotype" by Anthony Owusu Mensah, PhD student in the Biomedical Engineering Institute at Old Dominion University

Abstract:
Long QT Syndrome (LQTS) is associated with cardiac arrhythmia and sudden cardiac death. The Long QT Type 2 (LQT2) phenotype, which accounts for 35–40 % of all LQTS patients, is caused by mutations in HERG gene. The mechanisms of arrhythmia in presence of LQT2 conditions are not fully understood. We utilized anatomically and electrophysiologically realistic numerical simulations to elucidate the mechanisms of arrhythmia initiation in presence of blockade in rapid component of delayed rectifier potassium current, IKr. We utilized a 3D finite element model of rabbit ventricles integrated with His-purkinje network to simulate whole heart response to LQT2 conditions. We observed that the loss of IKr function produced more severe phenotype in cardiac Purkinje cells than that in ventricular myocytes. Our simulations also revealed that arrhythmia susceptibility is increased when there is a loss of IKr functionality. Our multi-scale computer modeling results provide useful insights into the potential mechanisms of arrhythmia in LQT2 conditions.

Bio:
Anthony Owusu- Mensah is a PhD student in Biomedical Engineering at Old Dominion University (ODU). He obtained a Master of Science degree in Electronics Engineering from Norfolk State University (NSU). Anthony currently works under the supervision of Dr Michel Audette (ODU) and Dr Makarand Deo (NSU). His research interest lies in developing working numerical single cell biophysical cardiac myocyte models and integrating these models into 3D anatomically realistic models to study arrhythmia initiation and maintenance mechanisms.