DATE: June 9, 2021

TO: Faculty and Students

FROM: Professor(s) Yang Kuang
Chair/Co-Chairs of Tin Phan
Defense for the PhD in Applied Mathematics
Committee Members Sharon Crook
Eric Kostelich
Alan Bryce
Carlo Maley

DEFENSE ANNOUNCEMENT
Candidate: Tin Phan
Defense Date: 07/08/2021
Defense Time: 1:00 PM
Virtual Meeting Link: https://asu.zoom.us/j/84528256872
Title: Prostate Cancer Modeling - exploring a path from theory and practice

Please share this information with colleagues and other students, especially those studying in similar fields. Faculty and students are encouraged to attend. The defending candidate will give a 40 minute talk, after which the committee members will ask questions. There may be time for questions from those in attendance. But, guests are primarily invited to attend as observers and will be excused when the committee begins its deliberations or if the committee wishes to question the candidate privately.

ABSTRACT
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The representation of a patient’s characteristics as the parameters of a model is a key component in many studies of personalized medicine, where the underlying mathematical models are used to describe, explain, and forecast the course of treatment. In this context, clinical observations form the bridge between the mathematical frameworks and applications. However, the formulation and theoretical studies of the models and the clinical studies are often not completely compatible, which is one of the main obstacles in the application of mathematical models in practice. The goal of my study is to extend a mathematical framework to model prostate cancer based mainly on the concept of cell-quota within an evolutionary framework and to study the relevant aspects for the model to gain useful insights in practice. Specifically, the first aim is to construct a mathematical model that can explain and predict the observed clinical data under various treatment combinations. The second aim is to find a fundamental model structure that can capture the dynamics of cancer progression within a realistic set of data. Finally, relevant clinical aspects such as how the patient's parameters change over the course of treatment and how to incorporate treatment optimization within a framework of uncertainty quantification, will be examined to construct a useful framework in practice.