Biomedical Discussion Group

"Image-based models of solid tumors behavior in diagnosis, treatment, and prediction"

Thursday August 18, 2016

3:30 –4:30 pm, Science Teaching Complex (STC) Room 1019

Dr. Madjid Soltani

Post Doctoral Fellow, Johns Hopkins University

Director, Computational Medicine Institute (CMI) at KNT University of Technology and Ministry of Health, Iran

Abstract:

Tumors are main causes of morbidity and mortality worldwide. Despite the efforts of the clinical and research communities, little has been achieved in the past decades in terms of improving the treatment of aggressive tumors. Understanding the underlying mechanism of tumor growth and evaluating the effects of different therapies are valuable steps in predicting the survival time and improving the patients' quality of life. Several studies have been devoted to tumor growth modeling at different levels to improve the clinical outcome by predicting the results of specific treatments. Recent studies have proposed patient-specific models using clinical data usually obtained from clinical images and evaluating the effects of various therapies.

In recent years, noninvasive imaging techniques have dramatically increased. Several imaging techniques are available to quantitatively evaluate the tumor status. New functional imaging techniques integrate morphological, pathological, and physiological alterations, used as early predictors of the therapeutic response. They allow earlier assessment of therapy response by observing alterations in perfusion, oxygenation, and metabolism. Exploring the relationship between patient-specific data (mostly medical images) and different parameters for tumor growth modeling or even the therapy related parameters can provide a reliable reference for therapy planning for the patients in order to decrease the side effects and increase life quality. More accurate models combined with therapies may contribute to better prediction of tumor growth and response to therapies, and patient management can emerge as a consequence. Modeling efforts will continue to develop and refine predictions regarding tumor prognosis, progression, and therapeutic efficacy. As a consequence software are developed which use baseline images of the tumor as inputs and give the personalized therapy plan or optimized amount of resection as the output.

Biosketch:

Dr. Madjid Soltani obtained his Ph.D. from the University of Waterloo and his research expertise is Transport Phenomena in biological systems with the focus of Nano-Particles Drug Delivery to Solid Tumors' Microenvironment. Immediately, he went to a Summer school of q-Bio at LANL and then joined to Johns Hopkins University for his Post doc in 2013. Dr. Soltani has worked as an Assistant Professor from 2015 in KNToosi University of Technology. He has taught Transport Phenomena in Biological Systems and Modeling and Simulation of Physiological Systems in both undergrad and grad levels. He published more than 40 journal papers and over 60 conference papers. Now, he is the director of Computational Medicine Institute (CMI) at KNT University of Technology and Ministry of Health in Iran.

If you are interested in meeting with Dr. Soltani, please email CBB, or visit cbb.uwaterloo.ca/events for information.

Keywords: imaging, tumor image diagnostics, tumor treatment and progression, predictive modeling, therapy planning, mathematical modeling of tumor growth, transport phenomena to biological and physiological systems, drug delivery to solid tumors

CBB UNIVERSITY OF WATERLOO

Event is FREE – please RSVP via EventBrite.

Pay parking available in lots M or D (map)

UNIVERSITY OF WATERLOO