UAA College of Engineering
University of Alaska Anchorage

UAA Professional Development Seminar Series

Real-time Organ Motion Management in MRI-guided Radiation Therapy

Presented by Ehsan Salari, Associate Professor, Wichita State University

Radiation therapy is one of the most commonly used modalities for cancer treatment. However, if unaccounted for, internal organ motion during radiation delivery may lead to under-dosing of cancer cells or overdosing of normal tissue, potentially causing treatment failure or normal-tissue toxicity. A recent development in the field of external beam radiation therapy is the advent of radiation therapy devices with an on-board MRI scanner, capable of providing a real-time view of the patient anatomy with a high temporal resolution during radiation delivery. The anatomy visualization offers the opportunity to devise a fundamentally new organ-motion management approach in which the radiation therapy plan actively adapts to anatomical variation in real time during irradiation. This research proposes a control-theoretic framework that uses the real-time MRI information available on MRI-guided radiation therapy platforms to monitor the delivery of radiation dose and to dynamically adjust the treatment plan in response to dose discrepancies due to organ motion.

Ehsan Salari is an Associate Professor of Industrial and Systems Engineering at Wichita State University. He received his Ph.D. in Industrial and Systems Engineering from the University of Florida in 2011. His research interests are in the area of Operations Research with applications to healthcare systems. A special focus of his research is the study of emerging technologies in cancer treatment and, in particular, radiation therapy to fully assess and exploit their potential through the application of mathematical modeling and optimization techniques. Prior to his current position, he was a postdoctoral fellow at Massachusetts General Hospital and Harvard Medical School in the Radiation Oncology department. He is a member of INFORMS, AAPM (The American Association of Physicists in Medicine), and IISE.

Friday, March 5th, 2021
11:45 am-12:45 pm
Online Via YouTube Live