MIE498H1: Research Thesis 2023-2024

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Number of Positions   1
Open to   Industrial Engineering Students
Term Offered   Full-Year (Y)
Research Area   Operations Research – Applied Machine Learning
Research Topic   Workload prediction for radiotherapy

Project Description

Background: Radiotherapy is one of the primary methods for treating cancer. More than half of the patients with cancer receive radiation treatment as part of their treatment. Given the growing demand for RT and limited capacity, there is significant interest in developing analytical models to optimize the use of relevant resources and reduce the treatment time for patients. Objectives and Approach: The objective of the proposed project is to develop Machine Learning (ML) and Simulation models that can accurately predict future workload for various resources (e.g., LINAC Machines, CT Scanners, etc.) at the radiotherapy department. Accurate predictions of future workload (e.g., multiple weeks ahead) can be used in planning for regular and surge resources to ensure treatments can be provided in a timely manner. To this end, we will leverage historical data from Princess Margaret Cancer Centre (PMCC) in Toronto, ON to train and test our proposed models. Potential Impact: This project is expected to result in new hybrid models specialized for predicting future workload of multiple resources weeks ahead and hence contribute to the operations research literature. In addition, through collaboration with PMCC, our developed methods have the potential of being implemented in practice and hence improving cancer care.

Additional Information   N/A

Application Instructions   Interested applicants should send their CV and
                                                transcript to Prof. Sarhangian.

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