USTHB

Séminaire hebdomadaire de Recherche Opérationnelle
Mercredi 30/04/2025

11h30-12h30
Salle de conférences du Bolc CAM
Faculté de Mathématiques

Orator : Islem **BENNADJA**
Title : Multi-Objective Optimal Control: SIR Model with Vaccination Campaigns

Abstract

Optimal control theory provides a rigorous mathematical framework for designing intervention strategies that optimize a performance criterion while satisfying the constraints imposed by the dynamic behavior of the system. While traditional formulations focus on a single objective, many real-world challenges require the simultaneous consideration of multiple and often conflicting objectives. This work addresses optimal planning of vaccination campaigns using the classical Susceptible-Infected-Recovered (SIR) epidemiological model. The problem is formulated with the dual objectives of minimizing the total number of infected individuals over a fixed time horizon and reducing the cost associated with vaccination strategies. Fundamental concepts such as Pareto optimality and solution methods for multi-objective problems are examined, highlighting their relevance in supporting informed and balanced decision-making.

Keywords: Optimal Control, Multi-Objective Optimization, SIR Model, Vaccination Campaigns