On the application of optimal control to infectious diseases

Cristiana J. Silva[1]
cjoaosilva@ua.pt

[1]Center for Research and Development in Mathematics and Applications (CIDMA), Department of Mathematics, University of Aveiro, 3810-193 Aveiro, Portugal

Abstract

In this talk, we present several optimal control problems applied to both in-host and communicable infectious diseases. We consider compartmental models given by systems of ordinary differential equations where control functions are introduced representing treatment, prevention and control strategies for stopping the transmission of virus and/or bacteria. Time-delays play a crucial role in the dynamics of infections, therefore we will consider optimal control problems with state-control delays and state constraints with a L^1-type cost functional. The examples given include in-host HIV and epidemic HIV/AIDS and COVID-19 models.