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Optimal Control for Mathematical Models of Cancer ...
Adding the two controls on the model , the optimal control model is given by The control variables and minimize the optimal control model (40) subject to the objective functional defined as where is the final time, and are weight constants of the exposed and corrupted population, respectively, while and are weight coefficients for each individual control measure.

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The study on the implementation of these control measures and how to deliver them optimally is of great importance. Thus, in this study, we consider optimal control of the helminth mathematical model with the preventive measures (health education) to sensitize the susceptible population and treatment by mass drug administration and sanitation.

Mathematical Model for Optimal Control of Soil-Transmitted ...
This model fits into our general framework for $n = m = 1$, once we put $A = [0, 1], f(x, a) = kx, r(x, a) = (1 - a)x, g = 0, 0 \leq t \leq T, u^* = 1, u^* = 0$. A bang-bang control As we will see later in § 4.4.2, an optimal control (\cdot) is given by $u(t) = \begin{cases} 1 & \text{if } 0 \leq t < t_0 \\ 0 & \text{if } t_0 \leq t \leq T \end{cases}$ for an appropriate switching time $0 \leq t_0 \leq T$.

An Introduction to Mathematical Optimal Control Theory ...
(b) Optimal control of epidemiological models. Many mathematical techniques exist for characterizing the true optimal control for a disease, such as equilibrium or final size analysis, depending on the system being analysed . We here focus on optimizing time-varying control of dynamical systems, for which optimal control theory (OCT) is widely ...

Applying optimal control theory to complex epidemiological ...
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Optimal Control for Mathematical Models of Cancer ...
As a guided tour to methods in optimal control and related computational methods for ODE and PDE models, An Introduction to Optimal Control Problems in Life Sciences and Economics serves as an excellent textbook for graduate and advanced undergraduate courses in mathematics, physics, engineering, computer science, biology, biotechnology, and economics. The work is also a useful reference for researchers and practitioners working with optimal control theory in these areas.

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A number of mathematical models for both classical and novel cancer treatments are presented as optimal control problems with the goal of constructing optimal protocols. The power of geometric methods is illustrated with fully worked out complete global solutions to these mathematically challenging problems.

Optimal Control for Mathematical Models of Cancer ...
Abstract. In this paper, we consider an optimal control model governed by a system of delay differential equations representing an SIR model. We extend the model of Kaddar (2010) by incorporating the suitable controls. We consider two control strategies in the optimal control model, namely: the vaccination and treatment strategies.

Optimal control of an epidemiological model with multiple ...
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Optimal Control for Mathematical Models of Cancer ...
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