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A comprehensive monograph on the subject, Optimal Control of Partial Differential Equations on Reticulated Domains is intended to address some of the obstacles that face researchers today, particularly with regard to multi-scale engineering applications involving hierarchies of grid-like domains. Bringing original results together with others previously scattered across the literature, it tackles computational challenges by exploiting asymptotic analysis and harnessing differences between ...

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Optimal Control Problems for Partial Differential ...
In optimal control theory, the Hamilton–Jacobi–Bellman equation gives a necessary and sufficient condition for optimality of a control with respect to a loss function. It is, in general, a nonlinear partial differential equation in the value function, which means its solution is the value function itself. Once this solution is known, it can be used to obtain the optimal control by taking the maximizer of the Hamiltonian involved in the HJB equation. The equation is a result of the theory ...

Hamilton–Jacobi–Bellman equation - Wikipedia
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Optimal Control Problems For Partial Differential ...
Translated by Jürgen Sprekels. Optimal control theory is concerned withfinding control functions that minimize cost functions for systemsdescribed by differential equations. The methods have foundwidespread applications in aeronautics, mechanical engineering, thelife sciences, and many other disciplines. This book focuses on optimal control problems where the stateequation is an elliptic or parabolic partial differentialequation.

Optimal Control of Partial Differential Equations: Theory ...
With H. Zidani: Optimal control problems with partially polyhedric constraints. SIAM J. Control Optimization 37 (1999), 1726--1741. Preprint; Second order analysis for control constrained optimal control problems of semilinear elliptic systems. Applied Math. Optimization (1998), 38-3, 303-325. Preprint

OPTIMAL CONTROL OF PARTIAL DIFFERENTIAL EQUATIONS
Our optimal control problem is new in two ways: (i) The controller has access to inside information, i.e. access to information about a future state of the system, (ii) The integro-differential ...

(PDF) Optimal Control of Stochastic Partial Differential ...
Then our problem is formulated as a stochastic control problem with partial information. We derive the Hamilton–Jacobi–Bellman equation. We solve this equation to obtain an explicit form of the value function and the optimal strategy for this problem. Moreover, we also introduce the results obtained by the martingale method.

An optimal consumption and investment problem with partial ...
Numerical methods for optimal control. Optimal control problems are generally nonlinear and therefore, generally do not have analytic solutions (e.g., like the linear-quadratic optimal control problem). As a result, it is necessary to employ numerical methods to solve optimal control problems.

Optimal control - Wikipedia
This stochastic control problem under partial information is solved by means of stochastic filtering, control and PDMPs theory. The value function is characterized as the unique continuous viscosity solution of its dynamic programming equation and numerically compared with its full information counterpart. ... The optimal full information ...

[2009.06521] Optimal market making under partial ...
Optimal control of partial fftial equations (PDEs) has tremendous applications in engineering and science, such as shape optimization, image processing, uid dynamics, and chemical processes. In this thesis, we develop and analyze several ffit numerical methods for the optimal control problems governed by elliptic PDE, parabolic PDE,

NEW COMPUTATIONAL METHODS FOR OPTIMAL CONTROL OF PARTIAL ...
In optimal control theory, the Hamilton–Jacobi–Bellman equation gives a necessary and sufficient condition for optimality of a control with respect to a loss function. It is, in general, a nonlinear partial differential equation in the value function, which means its solution is the value function itself.

[eBooks] Optimal Control Problems For
This dissertation contains three separate optimal control problems involving partial differential equations (PDEs) or ordinary differential equations (ODEs). In each problem, an objective functional representing the goal of the control process is minimized. First, a system of ordinary differential equations which describe the interaction of Human Im-

Optimal Control Problems in PDE and ODE Systems
A Linear-Quadratic Optimal Control Problem of Forward-Backward Stochastic Differential Equations With Partial Information. Abstract: This paper studies a linear-quadratic optimal control problem derived by forward-backward stochastic differential equations, where the drift coefficient of the observation equation is linear with respect to the state , and the observation noise is correlated with the state noise, in the sense that the cross-variation of the state and the observation is nonzero.

A Linear-Quadratic Optimal Control Problem of Forward ...
In this dissertation, we investigate optimal control of partial and ordinary differential equations. We prove the existence of an optimal control for which the objective functional is maximized. The goal is to characterize the optimal control in terms of the solution of the optimality system. The optimality system consists

Applications of Optimal Control
This book gathers the most essential results, including recent ones, on linear-quadratic optimal control problems, which represent an important aspect of stochastic control. It presents results for two-player differential games and mean-field optimal control problems in the context of finite and infinite horizon problems, and discusses a number ...

Stochastic Linear-Quadratic Optimal Control Theory ...
LECTURE NOTES: Lecture notes: Version 0.2 for an undergraduate course "An Introduction to Mathematical Optimal Control Theory".. Lecture notes for a graduate course "Entropy and Partial Differential Equations".. Survey of applications of PDE methods to Monge-Kantorovich mass transfer problems (an earlier version of which appeared in Current Developments in Mathematics, 1997).

Lawrence C. Evans's Home Page
We study parametric optimal control problems governed by a system of time-dependent partial differential equations (PDE) and subject to additional control and state constraints.

Is it possible to approximate a PDE with a neural network?
Abstract In this thesis we study mathematically and computationally optimal control problems for stochastic elliptic partial differential equations. The control objective is to minimize the expectation of a tracking cost functional, and the control is of the deterministic, distributed type.