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Title:
Title: On the linear quadratic problem for evolution equations with finite memory: distinct patterns, challenges, most recent advances.

Abstract: Proving the well-posedness of appropriate Riccati equations is a key step in the study of the optimal control problem with quadratic functionals for important classes of linear partial differential equations. In the case of evolution equations with finite memory, a Riccati-based approach to the optimization problem – geared towards attaining not only a closed-loop representation of the optimal control, but also its synthesis by way of solving a suitable system of operator equations – has been spurred by recent progress in a finite dimensional context. The aim of this talk is first of all to describe the study carried out on a control system in Hilbert spaces with memory of the inputs (only), namely, whose evolution depends also on the past values of the control actions. While the latter problem appears interesting enough in itself, its understanding constitutes a valuable step towards the Riccati-based solution of the optimal boundary control of significant integro-differential equations.
(This is an ongoing joint work with Paolo Acquistapace, Univ. di Pisa (Ret.))