# An Optimal Control of a Robot Systems

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**Abstract**

In this talk, we are concerned with the robot system formulated by partial differential equations. An optimal control with minimum energy cost of the systems is investigated in this talk. As we know, the optimal control with minimum energy cost in a Hilbert space is, in general, the control element with the minimum norm. So, at this point, we shall first transfer the robot system to an abstract evolution system in an appropriate Hilbert space, then discuss spectral properties and semigroup generation of the system operator. Finally, an optimal control with minimum norm is proposed, and its existence, uniqueness and feasibility are proved. Several interesting results will be presented.

**Keywords**: Optimal Control, Distributed Parameter System, Robot Arm
**AMS Classification**: 93C20, 35B35