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Optimization in Control Applications

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Mathematical optimization is the selection of the best element in a set with respect to a given criterion. Optimization has become one of the most-used tools in modern control theory for computing the control law, adjusting the controller parameters (tuning), model fitting, and finding suitable conditions in order to fulfill a given closed-loop property, among others. In the simplest case, optimization consists of maximizing or minimizing a function by systematically choosing input values from a valid input set and computing the function value. Nevertheless, real-world control systems need to comply with several conditions and constraints that have to be taken into account in the problem formulation—these represent challenges in the application of the optimization algorithms.

The aim of this Special Issue is to offer the state-of-the-art of the most advanced optimization techniques (online and offline) and their applications in control engineering.



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