

ABSTRACT

The work herein is intended to establish a proposed approach for designing a suboptimal controller for industrial control systems based on the use of the Quadratic performance index as a criteria for the design .

The design procedure for this suboptimal controller has been developed in two parts . First, the design has been done for a nonlinear control system having a constrained control vector, this design is applied through a new algorithm for selecting the weighting matrices of the Quadratic performance index, because most of the known methods has been developed for linear systems and unconstrained control vector . The second part of this work will consist of extracting the controller above to axcept any variations (through an interval) in the input level .

A fourth order industrial nonlinear control system has been taken as a simulation for the design . The obtained results clarify the simplicity and effectivity of the proposed approach .