

The solution of the infinite time reference trajectory tracking problem for discrete time systems possessing an exogenous component

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THE SOLUTION OF THE INFINITE TIME REFERENCE
TRAJECTORY TRACKING PROBLEM FOR DISCRETE TIME
SYSTEMS POSSESSING AN EXOGENIOUS COMPONENT

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Summary: In this talk the optimal control algorithm for discrete time systems minimizing a quadratic cost functional will be derived. The system considered is assumed to be linear and to possess an exogenous component. The cost functional is a quadratic tracking equation in which it is assumed that the weighting matrices are semi-positive definite, and moreover that a weighted sum of these matrices is positive definite. The growth rate of the exogenous component and reference trajectories are assumed to be bounded by a constant $1/c$, where c is the spectral radius of the closed loop matrix of the corresponding LQ-regulator. The time horizon considered is infinite.

Two special cases of the obtained controller are the controller minimizing the infinite time Minimum Variance cost criterium and the LQ-regulator.

At last, for the infinite time Minimum Variance controller, conditions will be obtained from which one can conclude whether a certain reference trajectory can be tracked ultimately or not.

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