

عنوان مقاله:

Control of Non-affine Systems Using the State-dependent Riccati Equation (SDRE)

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خلاصه مقاله:

The purpose of this paper is to present the application of the state-dependent Riccati equation (SDRE) method for controlling a class of non-affine nonlinear systems. By mentioning a class of non-affine system, a system with nonlinear states and control inputs is meant. The non-affine in control systems have been secluded in contrast to affine in control systems, especially in the SDRE field. The SDRE method is one of the approaches for solving the Hamilton–Jacobi–Bellman (HJB) equation as a closed loop nonlinear optimal control method. In this work, the SDRE is solved with exact solution (ES) method and online control update (OCU) formulation. The proposed algorithms are verified by three examples which are selected from previous works. The effectiveness of the SDRE is demonstrated through numerical simulations and comparisons with previous works which the SDRE brilliantly outperforms the other techniques in presence of external disturbance.

کلمات کلیدی:

SDRE; non-affine nonlinear system; exact solution; online control update; nonlinear optimal control

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