A NEW UPPER MATRIX BOUND FOR THE SOLUTION OF THE DISCRETE ALGEBRAIC RICCATI EQUATION

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This work concerns the discrete algebraic Riccati equation (DARE) which arises from the discrete-time linear quadratic control problem. We study a new upper matrix bound for the positive semidefinite solution of the DARE and derive the upper matrix bound using some matrix algebraic techniques and some properties of positive semidefinite matrices. Then we justify the upper matrix bound for the solution of the DARE using numerical examples and we prove that the matrix upper bound is less restrictive than some existing bounds in the literature.

Keywords: *Discrete algebraic Riccati equation, Upper matrix bound, positive semidefinite matrices, linear quadratic control.*