

عنوان مقاله:

A Generalization for Model Reference Adaptive Control and Robust Model Reference Adaptive Control Adaptive Laws for a Class of Nonlinear Uncertain Systems with Application to Control of Wing Rock Phenomenon

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خلاصه مقاله:

Lyapunov's direct method is a primary tool for designing Model Reference Adaptive Control (MRAC) and robust MRAC schemes. In general, Lyapunov function candidates contain two categories of quadratic terms. The first category includes the system tracking error quadratic terms or, in some cases, consist of the system state quadratic terms. The second consists of the parameter estimation error quadratic terms. To design MRAC and Robust MRAC systems, researchers have used a limited variety for choosing quadratic terms. In this study, we consider a general form for the tracking error quadratic terms. We consider a strictly increasing function that belongs to the class of c_1 , which is a function of state tracking error quadratic terms. It yields a general structure for stable adaptive laws for updating controller parameters. For the MRAC scheme, the global asymptotic stability of the closed-loop system and stability and uniform bounded tracking of robust MRAC schemes are guaranteed. To evaluate the performance of the designed controllers, we consider the single DOF wing rock dynamics.

کلمات کلیدی:

Lyapunov's direct method, Model Reference Adaptive Control, Robust Model Reference Adaptive Control, General adaptive laws, Strictly Increasing Function, Wing Rock

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