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Finite-Time Stability Criteria for Fuzzy Fractional Delay Differential Equations with Generalized Caputo Derivatives

Communication Info

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Abstract

This work is devoted to the analysis of fuzzy fractional delay differential equations governed by the generalized Caputo fractional derivative . By combining stepwise approximation methods with suitable Gronwall-type inequalities, we establish rigorous results on the existence and uniqueness of solutions. Furthermore, we derive explicit criteria that guarantee the finite-time stability of the considered systems. The theoretical contributions are complemented with numerical simulations, which not only confirm the analytical findings but also demonstrate the effectiveness of the proposed framework in capturing the dynamical behavior of fuzzy fractional delay models.

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