

Fractional dynamics based-enhancing control scheme of a delayed predator-prey model

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Abstract

To retard the onset of undesired bifurcation, the bifurcation control has developed into a theme of centralized research activities in delayed fractional-order system. In this paper, the problem of bifurcation control for a delayed fractional-order predator-prey model is investigated by employing an enhancing feedback control technique. The bifurcation point is firstly established for controlled model by using delay as a bifurcation parameter. Then, a series of numerical comparative studies on the effects of bifurcation control are implemented covering the partial or total removal of the branch for feedback gains. It reveals that the stability performance of the proposed model can be overwhelmingly elevated via the devised approaches in comparison with the dislocated feedback ones. A numerical example with simulations is ultimately designed to confirm the merits of the proposed theoretical results.

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