

عنوان مقاله:

NOVEL NONLINEAR CLOSED-LOOP OPTIMAL CONTROL ALGORITHM WITH ICA OPTIMIZATION ALGORITHM
FOR SPACE MISSINS

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خلاصه مقاله:

The present research is intended to present an algorithm for solving the nonlinear closed-loop optimal control problem with regard to space trajectory design viewpoint. To do so, issues such as optimal control theory, three-dimensional Fourier series and evolutionary optimization as Imperialist competitive algorithm (ICA) are utilized. Attempts have been made to introduce a new and comprehensive algorithm to cover free-time problems in the optimal control theory for space manoeuvres. The algorithm presented was solved and validated for the Edelbaum orbital transfer problem as a case study in which nonlinear dynamic equations were included. Results regarding to the three-dimensional Fourier series and the optimization method as ICA are achieved. This novel method provides an accurate and precise solution for this particular closed-loop orbital optimal control problem, which satisfies the objective of this work. Finally, this novel and new method is introduced for space mission designers as efficient method to achieve closed-loop guidance.

کلمات کلیدی:

Closed-loop; Optimal control; Space trajectory; ICA optimization; Three dimensional Fourier series

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