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Fractional Chebyshev pseudospectral method for fractional optimal control problems. (English) Zbl 1427.49037

Summary: In this paper, we introduce and apply a fractional pseudospectral method for indirectly solving a generic form of fractional optimal control problems. By employing the fractional Lagrange interpolating functions and discretizing the necessary optimality conditions at Chebyshev-Gauss-Lobatto points, the problem is converted into an algebraic system. By solving this system, the optimal solution of the main fractional optimal control problem is approximated. Finally, in some numerical examples, we show the applicability, efficiency, and accuracy of the proposed method comparing with some other methods.

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Chebyshev pseudospectral method; fractional Lagrange polynomial; fractional optimal control; optimality conditions

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