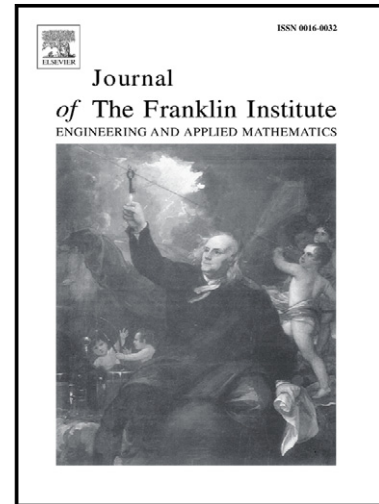


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Free Final Time Fractional Optimal Control Problems

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Free Final Time Fractional Optimal Control Problems

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Abstract. A formulation and solution scheme of free final time fractional optimal control problems is presented in this paper. The dynamic constraint is described by a fractional differential equation. Performance index considered is a function of both the state and control variables. The necessary conditions of optimality and the transversality condition are obtained using Lagrange multiplier technique. A numerical technique similar to Shooting method is used for solving the optimal conditions. Numerical example is provided to show the effectiveness of the formulation and numerical solution scheme. It is interesting to note that the final time changes with the interchange of the boundary conditions, which does not occur in classical optimal control problems.

Keywords: Fractional derivatives, Fractional order system, Optimal control

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