Kamocki, Rafał; Majewski, Marek
On the existence and continuous dependence on parameter of solutions to some fractional Dirichlet problem with application to Lagrange optimal control problem. (English)


Summary: In the paper, a Lagrange optimal control problem governed by a fractional Dirichlet problem with the Riemann-Liouville derivative is considered. To begin with, based on some variational method, the existence and continuous dependence of solution to the aforementioned Dirichlet problem is investigated. Then, continuous dependence is applied to show the existence of optimal solution to the Lagrange problem. An important point is that the solution to Dirichlet problem does need to be unique; therefore, the above dependence should be understood as a continuity of some multifunction – the concept of the Kuratowski-Painlevé limit of the sequence of sets is used to formulate this property.

MSC:
35R11 Fractional partial differential equations
35A15 Variational methods applied to PDEs
49J15 Existence theories for optimal control problems involving ordinary differential equations

Keywords:
fractional optimal control problem; fractional Dirichlet problem; fractional Lagrange problem; continuous dependence; Kuratowski-Painlevé limit

Full Text: DOI

References:


This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.