Existence and controllability of higher-order nonlinear fractional integrodifferential systems via resolvent operator

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Abstract

This work analyzes the existence of solution and approximate controllability for higher order non-linear fractional integro-differential systems with Riemann-Liouville derivatives in Banach spaces. Firstly, the definition of mild solution for the system is derived. Then a set of sufficient conditions for the existence of mild solution and approximate controllability of the system is obtained. The discussions are based on fixed point approach, and the theory of convolution and fractional resolvent. To illustrate the feasibility of developed theory, an example is given.

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