RESULTS OF ANALYSIS ON CONTROLLABILITY FOR HILFER FRACTIONAL DYNAMICAL SYSTEMS

ABSTRACT

The nonlinear controllability for Hilfer fractional dynamical systems are the subject of the study detailed in this thesis. The fixed point principle is used to investigate the controllability of neutral integrodifferential evolution equations with impulses and certain kind of periodicity results for neutral dynamical systems, optimal control for quasilinear evolution system, nonlinear Hilfer fractional Langevin dynamical systems, and nonlinear Hilfer fractional pantograph differential equations. In addition, using the Hilfer fractional derivative, the fractional COVID-19 model as well as numerical simulations are obtained by Homotopy perturbation method and there for performed to analyze the behavior of the solution. All results are generalized to the Hilfer fractional findings from previous studies. Examples are provided to demonstrate the principle.