

Abstract

In this thesis we study the approximation and viability of dynamical systems.

First we consider systems with discontinuous solutions, i.e. Impulsive differential equations with variable time of impulses and their discrete approximations by Runge-Kutta method of order p .

Second topic is the fractional differential equations with Caputo derivative of order $0 < q < 1$, the right hand side of these differential equations is upper semicontinuous. Sufficient condition for weak invariance of such systems is provided in this thesis.

Third we prove that almost all, in Baire Sense, differential equations with Scorza Dragoni right-hand side, defined on a closed convex cone of a Banach space, have unique solution. This solution depends continuously on the right-hand side and on the initial condition. The results are applied to fuzzy differential equations.