

Abstract

Many stochastic impulsive systems arising in nature exhibit hereditary properties, that is, state depends on the past time history. The time history dependence of states renders the equations of motion of stochastic impulsive systems in the form of stochastic impulsive integrodifferential equations. The research reported in this thesis deals with the problem of controllability of nonlinear stochastic impulsive integrodifferential systems. The results are established with suitable assumptions on the nonlinear functions. More precisely, we first study the controllability of the basic stochastic integrodifferential system and extended the analysis to a general nonlinear problem with impulsive effects. This technique has further been applied to the problem of controllability of stochastic impulsive systems with memory integrals and time-varying delays. Further, we deal with the controllability of second order stochastic nonlinear impulsive systems. In this context, we have first obtained the controllability to the second order stochastic impulsive systems with the initial conditions. Then the same technique has successfully been extended with the nonlocal conditions. All the results are obtained by using the fixed point techniques and the controllability of nonlinear stochastic impulsive systems depend on the controllability results of an associated linear stochastic impulsive system.