ABSTRACT

The research reported in this thesis deals with asymptotic null controllability of nonlinear systems and nonlinear neutral Volterra integrodifferential systems. Several sufficient conditions are established for the controllability of such systems. Also controllability of nonlinear Volterra integrodifferential systems including neutral systems and systems with implicit derivative is considered. The results are obtained by using the fixed point principles due to Leray-Schauder, Darbo and Sadovskii. The same problem is studied for nonlinear delay systems and nonlinear integrodifferential systems including Volterra systems with infinite delay in the setting of infinite dimensional Banach spaces. For this the asymptotic fixed point theorem due to Nussbaum and a variation of Schauder's fixed point theorem are used. All the results generalize the previous results of several researchers.