
A NOVEL EMPIRICAL APPROACH TO ANALYZE THE STABILITY OF
GENERALIZED LOGISTIC MAP

Khamosh
Research Scholar
Department of Mathematics
Baba Mastnath University, Rohtak (HR)

ABSTRACT:

The standard logistic map and its variants are one of best and simplest form of systems that have achieved an important position in dynamical systems and in various fields like biology, engineering, electronics, cryptography and much more. A generalization of the logistic map is considered by taking two parameters α and β in which standard logistic map, cubic, quartic etc. are considered that reproduce different logistic map. This article is concerned with the stability of generalized logistic map with the help of superior orbit using time series graphs. Here, we have shown that the stability of generalized logistic map is enhanced due to extra degree freedom of the control parameter β . The standard logistic map is stable for $0 < r \leq 3.2$ in Picard orbit but in superior orbit, we analyze that the range of stability of generalized logistic map increases very drastically. In superior orbit we get more large value of r than that of Picard Orbit which depends on both control parameters α and β . Empirical study is also presented with tables and time series graphs.

Keywords: Fixed Point, Generalized logistic map, Superior Orbit, Picard Orbit, Time series graph, Stable behaviour.
