

## Feigenbaum Universality, Chaos and Fractal Dimensions in Discrete Dynamical Systems

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**Abstract :** The salient feature of this paper is primarily concerned with Ricker's population model:  $f(x) = x e^{r(1-x/k)}$ , where  $r$  is the control parameter and  $k$  is the carrying capacity, and some fruitful results are obtained with the following objectives: 1) Determination of bifurcation values leading to a chaotic region, 2) Development of Statistical Methods and Analysis required for the measure of Fractal dimensions, 3) Calculation of various fractal dimensions. These results also help that the invariant probability distribution on the attractor, when it exists, provides detailed information about the long-term behavior of a dynamical system. At the end, some open problems are posed for further research.

**Keywords :** Feigenbaum universality, chaos, Lyapunov exponent, fractal dimensions

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