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PERIOD DOUBLING BIFURCATIONS AND ASSOCIATED UNIVERSAL PROPERTIES IN THE VERHULST POPULATION MODEL

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Abstract

In this paper, we consider the Verhulst Population Model [18] defined on a suitable subset of the real line: f(x) = x + px(1 − x) where x 2 [0, 4/3] and p 2 (0, 3] is an adjustable positive parameter. In order to establish an universal route from order to chaos through successive period-doubling bifurcations, we develop some useful numerical algorithms to obtain periodic points and bifurcation values of periods 20, 21, 22, 23, ------ and study some associated universal properties.

Key Words : Period-Doubling Bifurcations/ Periodic Points/ Feigenbaum Universality/Chaos

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