ABSTRACT

Master’s thesis: 119 p, 18 fig., 25 tabl., 2 applications, 10 sources.

The object of study – dynamical systems.

Subject of research – methods of Lyapunov exponent calculation, methods of chaotic and stochastic time series determinization.

Purpose – to build an algorithm, which computes Lyapunov exponent for time series data; to build an algorithm that determines whether a sequence is chaotic or stochastic.

Background of study – building algorithms that help analyze dynamic systems. This data can be used in physics, economy.

In this study, different methods and their results were compared. While studying the possible fields of usage, Lyapunov exponent was found for real world data, such as stock market price or modelling of cancer.

LYAPUNOV EXPONENT, CHAOS, DYNAMIC SYSTEM, STOCHASTIC SYSTEM, LYAPUNOV SPECTRUM.