ABSTRACT

Bachelor thesis: 65 p., 18 fig., 6 tabl., 2 applications, 4 sources.

Object of research: transition matrix of the Markov chain describing a process.

Objective: developing an algorithm for the permutation of transition matrix to block-diagonal form in order to identify meta-stable states in the Markov chain; analysis of the effectiveness of the algorithm.

Method of research: analysis of SVD of the transition matrix.

The paper describes development of an algorithm that can identify meta-stable states of Markov chains; also studies the efficiency and effectiveness of the algorithm in comparison to some other similar algorithms.

Shows some applications of this algorithm, including applications in queuing theory and the code design.

A software product allows a user to apply the algorithm developed in this paper to artificially generated and real data. The software implemented in the environment of Visual Studio in C # using third party library ILNumerics. Includes examples of applications to artificially generated and real data.

MARKOV CHAIN, TRANSITION MATRIX, QUEUING THEORY, SINGULAR VALUE DECOMPOSITION.