

ABSTRACT

Master thesis: 83 pages, 21 figures, 31 tables, 34 sources.

Topicality. As for today, anomaly detection is one the main drivers for data analysis. The ability to detect rare and atypical characteristics and events is widely used in different domains: engineering, economics, health care and others.

With further development of Internet of Things, the demand for automated systems for monitoring and decision making, capable of early detection of faults and errors in critical infrastructure, and that will be able to prevent unwanted effects, will only grow. This is the reason why development of effective anomaly detection algorithms is so important.

Aim of the work is to increase decision making speed in automated control systems achieved with the development of effective anomaly detection algorithms.

To achieve the goal, the following **objectives** must be completed:

- do an overview of existing methods and algorithms for time series anomaly detection;
- conduct a comparison analysis of mentioned methods and algorithms;
- formalize the anomaly detection problem for time series;
- develop the anomaly detection algorithm based on linguistic models;
- compare the developed algorithm to existing experimentally;
- analyze the results.

Objects of research are anomalies in processes represented with time series.

Subjects of research are methods and algorithms for anomaly detection in time series.

Methods of research used in this work are based on machine learning methods and the method of expert evaluation. Among others, structural, linguistic and syntax methods are used.

Scientific novelty. The scientific novelty of this result consists on the usage of linguistic modelling methods which haven't been used for this purpose previously.

Publications. The work materials were published in the Slovak International Scientific Journal and in "Information Systems and Management Technologies" conference thesis compilation.

ANOMALY DETECTION, TIME SERIES, CLASSIFICATION, PATTERN
MATCHING