ABSTRACT

Explanatory note size – 109 pages, contains 26 illustrations, 23 tables, 4 applications, 21 references.

Topicality. Mathematical statistics and probability theory are actively used in various fields of humanity: physics, data science, medicine, business or agriculture. For the processes of analysis and forecasting of time series based on fuzzy models with an undefined (stochastic) membership function, which also refer to probability theory. But to date, no tool has been developed in the form of a programming language for automating calculations and finding the answer. Three factors converge here: linguistic modeling, fuzzy model theory, and probability theory.

The aim of the study. Create a programming language for describing the processes of analysis and forecasting of numerical series based on fuzzy models with undefined functional affiliation.

The object of research: Linguistic models of time series.

The subject of research: Programming language.

To achieve this goal, the **following tasks** were formulated:

— analysis of theory and existing solutions;

— software development;

— study of the effectiveness of the developed software.

The scientific novelty of the results of the master's thesis lies in the practical areas of application of linguistic modeling. The so-called direct linguistic transformation. At the same time, the problem of reverse linguistic transformation arose – the transition from linguistic chains to the original time series. The problem is not solved at this moment. This is exactly what you need software with a hybrid of probabilistic and fuzzy sets.

The result is achieved by developing software based on fuzzy sets and probabilistic membership functions.

The practical significance of the obtained results is that the software can be used in the stages of development of all areas that require the calculation of linguistic models of time series.

Relationship with working with scientific programs, plans, topics. Work was performed at the Department of Informatics and Software Engineering of the National Technical University of Ukraine «Kyiv Polytechnic Institute. Igor Sikorsky».

Approbation. The scientific provisions of the dissertation were tested at the Third All-Ukrainian scientific and practical conference of young scientists and students "SOFTWARE ENGINEERING AND ADVANCED INFORMATION TECHNOLOGIES" (SoftTech-2022 autumn) - Kyiv.

Publications. The scientific provisions of the dissertation were published in:

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