

Annotation on PhD Thesis

Title: Decision Support on Small size Passive Samples

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Keywords: mathematical modeling, small sample, passive experiment, correlation analysis, regression analysis, outliers, the method of point distributions.

Objective: A construction technique of adequate mathematical models for small size passive samples, in conditions when classical probabilistic-statistical methods do not allow obtaining valid conclusions was developed.

Field of study: small size passive samples obtained in different conditions.

Research objective: to develop a construction technique of adequate mathematical models for small size passive samples, in conditions when classical probabilistic-statistical methods do not allow obtaining valid conclusions.

Research tasks:

- to analyze various approaches and methods of small size samples processing;
- to investigate the possibility of using existing criteria for outliers finding in small size samples;
- to investigate the possibility of the linear correlation detection in the small size samples;
- to develop a methodology for constructing decision support systems in cases of passive experiment and impossibility of obtaining a large amount of raw data;

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- to test the developed technique on the obtained data in various conditions;
 - to substantiate and to prove the applicability of the developed technique.

The scientific novelty and originality of the research: the original methodology for construction the decision support systems which give the most accurate recommendations for decision-makers basing on passive small samples.

The relevance of research: there are many areas where it is impossible to obtain large amounts of data, and therefore, the decision-making using classical techniques is extremely difficult or impossible.

Important scientific problem solved in the work: the determination of probabilistic and statistical methods of decision support based on small size samples obtained during the passive experiment.

The theoretical significance of the study lies in the methodology of improving the quality of decisions taken on the basis of the proposed approaches and algorithms based on probabilistic and statistical methods of data processing

The practical significance of the research results. The decision support methods, proposed in the thesis, can be widely used in the statistical analysis in various fields of research, where it is impossible to obtain a large amount of data.

The research results implementation: The results of the research are implemented in the direct care of Department of Endoscopic and Minimally Invasive Surgery of the Republican Clinical Hospital (Tiraspol), into educational process of the department "Biology and Human Physiology" and "Therapy 2" Medical Faculty of the T.G. Shevchenko University, into the work of the Research Laboratory "Mathematical Modeling" and academic Master's program in "Computer Science and Engineering" of the same university.