## ABSTRACT

Multiple hypothesis testing is an important topic in statistics. Therefore, the problem addressed in this thesis is an important one. It is also a topic in which it is difficult to make a significant improvement, for various reasons. One reason is that often different users may have different objectives and with multiple hypotheses there is no unique objective function. In the thesis is recognized this fact and as the objective functions, estimated the quality of made decisions, are used minimization of the probabilities of the errors of one kind at restrictions of the probabilities of the errors of second kind. Such approach is a new one which causes the uniqueness of the regions of acceptance of hypotheses and, consequently, improves the quality of hypothesis testing.

Thus conditional Bayesian tasks of testing many hypotheses are stated and solved. The concept of conditionality is used for designation of the fact that the Bayesian tasks are stated as conditional optimization problems where the probabilities of one- type errors are restricted and, under such conditions, the probabilities of second-type errors are minimized. The properties of obtained decision rules are investigated, and, on their basis, it is shown that the classical Baycsian problem of hypotheses testing is a special case of the considered. The calculation results of concrete examples have shown that the qualities of offered conditional tasks surpass the quality of the classical Bayesian task. They completely confirm the results of theoretical investigations. The convenience, simplicity and naturalness of introduction of similar gradation Kiefer, (1977) by the level of certainty of hypotheses testing on the basis of concrete observation result are shown in offered conditional tasks.

Quasi-optimal procedures of many hypotheses testing are offered, They significantly simplify Bayesian algorithms of hypotheses testing and computation of the risk function. The obtained general solutions are reduced to concrete formulae for multivariate normal distribution of probabilities. The methods of approximate computation of the risk functions in Bayesian tasks of testing many hypotheses are offered. The properties and interrelations of the developed methods and algorithms are investigated. On the basis of simulation, the validity of the obtained results and conclusions made is shown.

The results of sensitivity analysis of the conditional Bayesian problems are given and their advantages and drawbacks are considered.