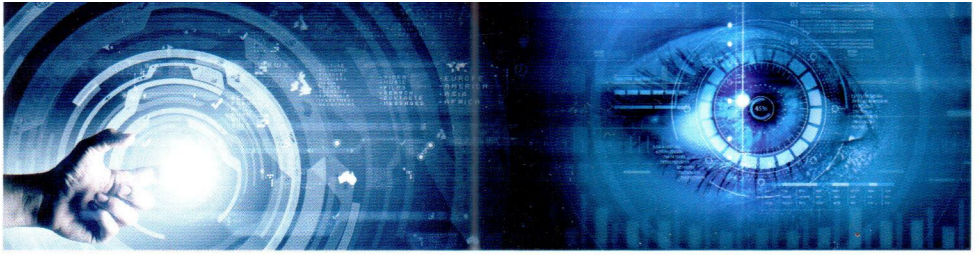

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BOOK OF ABSTRACTS

Industrial Research Institute for Automation and Measurements PIAP

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On the properties and application of tests for homogeneity of variances in the problems of metrology and control

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In this paper, we have investigated the distributions of statistics of classical tests for homogeneity of variances (Neyman–Pearson, O'Brien, Link, Newman, Bliss–Cochran–Tukey, Cadwell–Leslie–Brown, Overall–Woodward Z-variance and modified Overall–Woodward Z-variance tests), including the case when the standard normality assumption is violated. Some advantages and disadvantages of certain tests have been fixed. For a number of tests, the tables of percentage points have been corrected. The comparative analysis of the power of classical tests has been carried out. The studied tests for homogeneity of variances (including Bartlett, Cochran, Hartley, Fisher, Levene, Ansari–Bradley, Mood, Siegel–Tukey tests) have been ordered according to the power decrease. We have proposed and studied the method of application of these tests under violation of the standard assumption, which is based on the interactive simulation of distributions of the test statistics.

The research is carried out with statistical simulation methods and the computer technologies of data analysis. The application of considered tests is based on the developed software of statistical data analysis ISW.

Diagnostic systems of mobile robot technical state.

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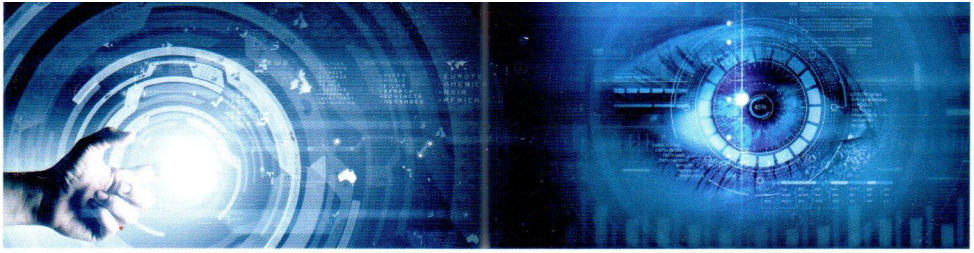
We consider the possibility of determining the technical condition of the mobile robot using the test and diagnostic tools. The analysis findings allowed determining the interaction between the object of diagnosis and control and diagnostic tools. This interaction is the process of applying multiple actions (outputs) to the diagnosed object, as well as multiple shift and analysis of responses (outputs) to these actions. The mobile robot influences may come from control and diagnostic tools or external (regarding the diagnosis system) signals, which are determined by a working algorithm of facility operation. Depending on the operation mode, there are the systems of a functional and test diagnostics. The generalized functional diagrams of these systems are presented. The use of the functional diagnosis system to verify the proper operation and troubleshooting of the most critical equipment, assemblies and systems of a mobile robot violating the normal functioning were presented. From this, we can conclude that these systems work when the mobile robot is used for intended purposes. They can be used in simulation modes of the robot operation too. In this case, the workflow simulation should be provided. Such a use of the functional diagnostics system should be employed upon debugging and repair of the system. It was found that the development of diagnostic systems for interaction between the object and diagnostic tool required solving the following tasks, namely feasibility of selecting the type and purpose of the diagnostic system and analysis of the physical processes occurring in the diagnosed object.



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