THE INNOVATIVE TECHNOLOGY OF RICH ENERGOABSORBENT AGRICULTURAL MACHINERY OPERATION TRAINING

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The exploitation of modern rich energoabsorbent technology is connected with high costs. This process requires a specialist with high level of training in the relevant jurisdiction. It is recognized that the best learning tool is a simulator technician, combining the possibility of a combined theoretical and practical training.

The authors have been working in the field of a simulator for a long time. An example of their result may be development of an integrated simulator of a harvester (KTZK) "Polesie".

KTZK "Polesie" contains the models of all major controls and instrumentation. It simulates a virtual situation behind a cab, the work units combine and interact working bodies. The structure KTZK "Polesie" includes the following components: cab Harvester GLC-1218 with the administration, control devices and platform; stand, inside of which there are simulator electronic units; instructor's working place, who formulates the task for the specialist being taught, a media center with a screen to simulate situation behind a cab; monitor that simulates rear-view mirror to show the process of grain unloading.

The electronic subsystem KTZK "Polesie" consists of a teacher's computer, and distributed modules of data acquisition and the formation of control signals leading by a server module. The modules are interconnected with an RS-485. The server module is connected to the teacher's computer via USB.

The electronic subsystem KTZK "Polesie" has the following main components: the electronic pickup and generation of signals, coming from the cabin equipment, the systems of effort simulation and the influence on the operation parts; the computer system for mathematical calculating of the models of natural and artificial objects, The formation of the situation image behind a cab. The integrated software includes a program of reading and primary processing of sensor data, the formation of combine harvester indicators and the simulation of sensor signals that are not included in the simulator system, the visualization program of the cab environment, networking programs.

The generation of cab behind-image dynamics on a multimedia screen in front of the student is made by blending vector images onto actual fragmented videostreams. Vector images are obtained by the means of three-dimensional modeling of spatial objects using the mathematical apparatus of the deformation of their images, the fractal solid geometry, genetic algorithms and shader technologies.