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BIOHLIT for automation of biological research at JINR

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The BIOHLIT information system (IS) for analyzing behavioral and pathomorphological changes in the central nervous system when studying the effect of ionizing radiation on laboratory animals. Information system is being jointly developed by specialists from MLIT and LRB JINR.
The information system provides interfaces for: storing experimental data in a single information space (for behavioral tests and pathomorphological changes in the central nervous system), processing video files of behavioral tests (open field, T-maze, etc.). To solve this problem it was necessary to design and develop several subgroups of modules: data storage, algorithmic block, API-server, web-client. Together, these modules reduce time costs and minimize the human factor in dealing with histological slides. This will allow processing experimental data in no time and defining qualitative and quantitative changes in the central nervous system after exposing to ionizing radiation. For these purposes, on the basis of modern technologies of computer vision and machine learning, an algorithms was developed; it enables to automate the analysis of the behavioral reactions of laboratory animals through video files. For automate the processing of pathomorphological changes, active work is underway to develop a neural network approach for slides segmentation.

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