



Contribution ID: 63

Type: Poster

Algorithmic block for behavioral tests in the BIOHLIT information system for radiobiological studies

Friday 8 July 2022 11:15 (45 minutes)

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 IS is necessary for storing data in a single information space, enhancing the detection of laboratory animals in the behavioral tests (Open Field, T-maze, etc.) arena, calculating individual behavioral patterns, as well as for reducing time and energy costs, minimizing the human factor when 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 algorithm was developed; it enables to automate the analysis of the behavioral reactions of experimental animals through video files.

To solve this problem, it was necessary to develop several subgroups of algorithms: algorithms for the automated marking of the field of experimental setups, algorithms for tracking the animal's position in experimental setups of different types and algorithms for evaluating the animal's behavioral patterns that characterize its emotional status and orienting-exploratory reactions. As a result of the operation of this algorithm, the information obtained is stored in different forms: a visualized track of the laboratory animal's movement, a video file with tracking the laboratory animal's position, a heat map by sectors and a JSON file that stores all the information obtained from the video file for subsequent statistical analysis. The JSON file contains information on automated marking by the sectors and boundaries of the experimental setup, a track of the animal's movement by frame coordinates, the characteristics of the original video file (frame size, number of frames per second). These data are required for additional analysis (statistical, etc.).

Agreement to place

Participants agree to post their abstracts and presentations online at the workshop website. All materials will be placed in the form in which they were provided by the authors

Author: BUTENKO, Yuri (JINR)

Co-authors: STADNIK, Alexey (Dubna university); KOLESNIKOVA, Inna; Ms GOLIKOVA, Kristina; UTINA, Dina (JINR)

Presenter: BUTENKO, Yuri (JINR)

Session Classification: Posters