

THE COMPLEX USE OF COMPUTER AND VIDEO FOR KINEMATIC STUDIES

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The important problem of modern sport is the technical training of sportsmen. A successful solution of this problem is impossible without deep study of the structure of athletes' movements.

The video complex used in our research includes hardware and software programs. The hardware include:

-ordinary computer;

-video camera and videotape-recorder;

-and non-standard equipment (video processor for the transmission of video signals digitally in computer's memory).

The fragments, made in conditions of training or competition, are digitized by means of special video charges, which allow one to convert a video signal into numerical form. All fragments will be converted into files in the AVI format (Video for Windows). It is possible to reproduce these files on the screen of the monitor with the help of the Microsoft Windows universal player-standard program.

It is possible to demonstrate a file once or as a film-ring, frame by frame rewinding and in a freeze-frame.

Stopping a video fragment is accompanied by fixing a frame and stopping the time. A standard program package ensures access to each frame of the video sequence. Consequently, any frame may be put in correspondence to time. This allows one to calculate a phase structure of athletic action and determine cinematic features of sport technique.

For biomechanical studies special attention is paid to the programs for editing photos. Any frame may be copied and inserted in the file of the Microsoft Photo Editor or Microsoft Photo Shop. Each point of this photo will correspond to a pair of coordinates, shown on the screen of the monitor. Having copied several frames in given time intervals, one can define a change of the coordinates of points in dependence upon time.

In this way it is possible to calculate a speed or velocity of motion, and other facts interesting for the researcher. By the way, a standard effects kit allows one to change the brightness, contrast, color to find the position of checkpoints on investigated objects (it may be a body or athletic equipment). One can expose a necessary balance on photos by changing offered parameters in the Preview window or using autobalance, calculated by the computer. A given photo is easy to print.

A series of such photos may be used as a kinogramma and provide the basis for biomechanical calculations.

In order to add graphic elements to a photo use the Paint editor.

The offered way of registration allows one to apply practically any study of movement by athletes with pixel accuracy.