

INFORMATION TECHNOLOGY ON SMARTPHONE FOR ASSESSING THE ADAPTATION CAPABILITIES OF THE HUMAN BODY

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An important role in assessing the body's adaptive reserves under conditions of physical and emotional stress is played by information obtained with the help of special tests. Such tests should be convenient enough to quickly obtain the result, including at home and in the field. The rapid development of smartphone technology helps to decide this problem [1].

A distinctive feature of the proposed information technology (IT) is that the registration of a pulse wave is carried out using the built-in smartphone camera without additional technical means (Fig. 1). To overcome the known problems that arise with this method of signal recording, IT uses a set of intelligent computational procedures that provide reliable recognition of true pulse wave bursts caused by heart beats and false bursts generated by artifacts. As a result, it was possible to determine the parameters of cardiac cycle variability before and after exercise under real conditions with acceptable accuracy.

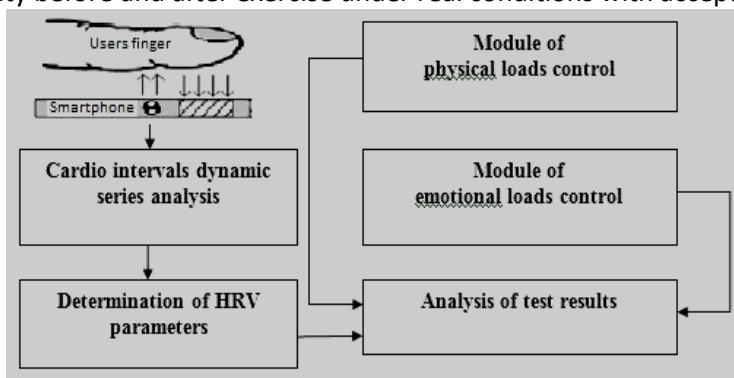


Fig. 1 – Block diagram of the proposed information technology

To manage the loads on the internal processor of the smartphone, software modules are implemented that provide convenience for testing in the field and at home. The physical load control module implements the virtual teacher animation procedure, which demonstrates the correct technique for performing squats, the pace of which is set depending on the age and fitness of the subject. The emotional control module is based on the Stroop's effect, which boils down to the performance of mental work in conditions of time pressure.

Test results are provided in the form of a cognitive graphic image that can be interpreted by a person without special medical education.

References:

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