METHOD OF HAND MOVEMENT TESTING ON GRAFIC TABLET

O. Avrunin, K. Selivanova

Kharkov National University of Radioelectronics, Department of Biomedical Engineering, Lenin av., 14, 61166, Kharkov, Ukraine

Everyone has the individual properties of hand movement, which include writing and drawing, pressing force, the various manipulations of small objects, work on the keyboard, etc. [1]. A fine motor skill is a sequence of fine hand movements to perform a specific task. A lot of movement disorders in the early stages appear as violations of fine hand movements [2]. Therefore, actual task is as early as possible to identify possible violations of fine motor skills. The use of computer technology in this type of research reduces the role of the subjective factor [3].

The purpose of this work is to develop computer tests estimates individual characteristics of fine motor skills dominant hand.

We developed a specialized program, which is implemented on a standard personal computer with standard digital graphic tablet high-resolution complete with the pen (stylus). Working with graphic tablet provides for the development of fine motor skills of hands. Navigation stylus is comfortable, because the muscles of the hand and arms are always relaxed, fingers and palm on the move. Pen is a natural tool for the human hand, so navigation and operation of the PC with the pen is convenient and accurate. Completing quests with a tablet is a complex coordinated process as the act of writing.

In order to study individual characteristics of the fine motor skills experiment was conducted. The experiment involved 34 people (15 women and 19 men) aged 20-23 years. In 33 people leading arm was right, and only one participant – the left [3]. Each participant in the experiment was set to an individual code with information about the age, sex, dominant hand, results of the survey the health status and the serial number. Testing included an execution 20 job templates. Every human drew straight lines of different lengths with different angle of away protection and spatial orientation. The figure 1 shows the first results of the test [3].
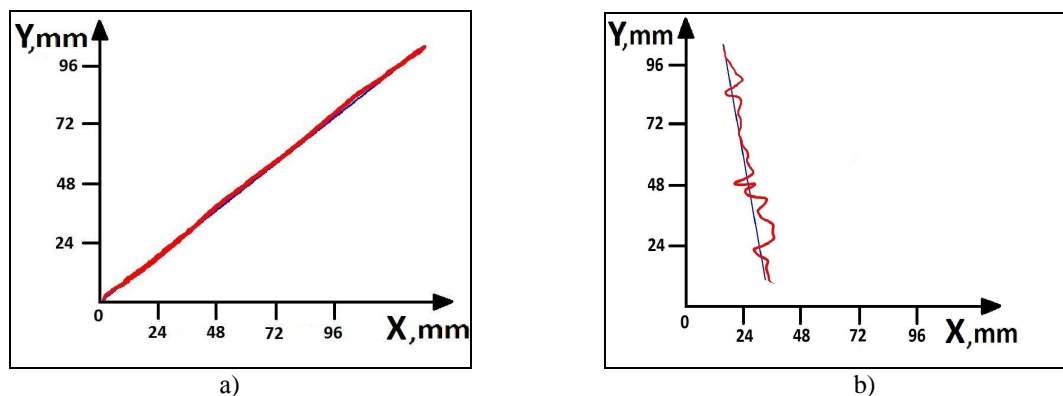

Fig. 1 The test results of the experiment participants in norm (a) and pathology (b)

One minute is given to perform a single task. Specialized computer program records the 8 indicators: the execution time of each test, the length of the given and the experimental line, the number of correctly executed and some technical inaccuracies jobs, the number of missed assignments. In graphically displays the force and pressure deviation coordinate lines. Thus, time testing one participant of the experiment is on average no more than 10 minutes, given the fact that some of the test is performed slowly enough. The proposed set of data for analysis a sufficient to show the general condition of human fine motor skills.

The obtained experimental results show the effectiveness of the developed method. Thus, with the using specialized program, we can identify changes in fine motor skills and to quantify the level of motor skills.

In the perspective, will be tested several groups of people (normal, stress, various hand movement disorder). Indicator comparison norm with the values of pathology allows estimating objectively state of fine motor skills. This will install the diagnostic reliability of proposed method.

References

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