

## THE HISTORY AND FUTURE OF VIBRAIMAGE TECHNOLOGY

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**Abstract:** *The article gives the history of the vibraimage technology, background base, analyzes and development, described the advantages and disadvantages of vibraimage technology in assessment of psychophysiological state of a person. The applications of vibraimage technology for the detection of various psychophysiological states is discussed, a cybernetic approach to a person is considered based on information-energy characteristics measurements.*

**Keywords:** *Vibraimage, vestibulo-emotional reflex, frames difference, information-energy scale, psychophysiological state.*

In the first monograph about vibraimage [1] were proposed the several versions of the vibraimage technology appearance, despite the fact that it happened not so long time ago (about 20 years ago), it is difficult for me to choose the main version of the development events, too many actions and knowledge underlies on the vibraimage technology. The technology developed gradually, the term vibraimage appeared only 3 years after the appearance of the very first vibraimages. Looking back to vibraimage history I did the main conclusion that the vibraimage technology could not have appeared earlier than in the 90s of the last century, when the development of tech and IT provided the required hardware (webcams and PC for real time image processing), although the theoretical background of the vibraimage technology was created long before this time.

I think that the famous Soviet physiologist Nikolai Bernstein, who used the recording of films for human motion analysis, approached quite enough to create a similar technology, and made a paradoxical conclusion about the discreteness of motions in the 20s of the 20th century [2]. Konrad Lorenz, observing the reflex movements of animals in the 60s of the last century, established that the frequency of movements is proportional to the level of aggression [3], and could also invent the vibraimage technology. Just like Mira-Y-Lopez around the same time (in the middle of 20 century), developed a myokinetic technique that practically determines a person's psychophysiological state by analyzing his movements [4] and is using now for psychophysiological testing. But only the appearance of relatively powerful personal computers allowed to process live video with the required resolution and frame rate in real time, which is the technical basis of the technology of vibraimage. The remaining factors are subjective in nature and the coincidence of experience in the development of photonic systems with biometric research and developments as the

presence of my aggressive cocker spaniel certainly helped me to combine the various components in one technology. But after Freud [5] we know that nothing happens accidentally in the world, there are no words that are accidentally said, a person does not have random movements and it's no accident that the technology of vibraimage appeared in Russia.

The most of the applications of vibraimage technology are aimed at the study of the psychophysiological state (PPS) of a person, therefore ELSYS' team, which has basically a technical education, is forced to engage not only in its technical work, but operate in the fields of medicine, physiology and psychology. Such problems did not stop the outstanding scientists of past years, who without knowing it, laid the theoretical foundations of the vibraimage technology.

Over the past time I was interested to see how obtained by the new system practical results for the first time in the 21-st century, were predicted and described by the brilliant scientists of the past, whom I consider necessary to list by name, beginning from the great Ancient Greek philosopher and scientist Aristotle, who claimed that life is a movement. I cannot describe in this article the contribution of each from the great scientists to the vibraimage technology, especially since this has already been done, I just cite references to the work of scientists and related work on vibraimage technology. Including I. M. Sechenov [6, 1], Charles Darwin [7, 1], I. P. Pavlov [8, 9], Sigmund Freud [5, 10], Carl Jung [10, 6], N. A. Bernstein [2, 1], Norbert Wiener [11, 5], Conrad Lorentz [3, 1], Mira-i-Lopez [4, 1], Howard Gardner [12, 6].

Unfortunately, the modern science has a predominantly narrow specialization, and it is difficult for me to call the names of modern scientists who are able to combine completely different scientific directions in a one technology.

Therefore, many developments have to be done by ELSYS team, which would be absolutely ineffective, if the vibraimage technology did not have scientific supporters and partners from all the world that would make significant progress in such areas as mathematics, medicine, physiology and psychology, as well as providing substantial support in commercialization of vibraimage technology and the developments of new applications. The technical base of vibraimage technology is simple frame difference accumulation [13] and physiological base of vibraimage technology is vestibule-emotional reflex discovered by ELSYS team [14].

In order to analyze the future of vibraimage technology, it is necessary to objectively evaluate its advantages and disadvantages, as well as the differences between vibraimage technology and other similar technologies for assessment or measurement of the psychophysiological state parameters of a person.

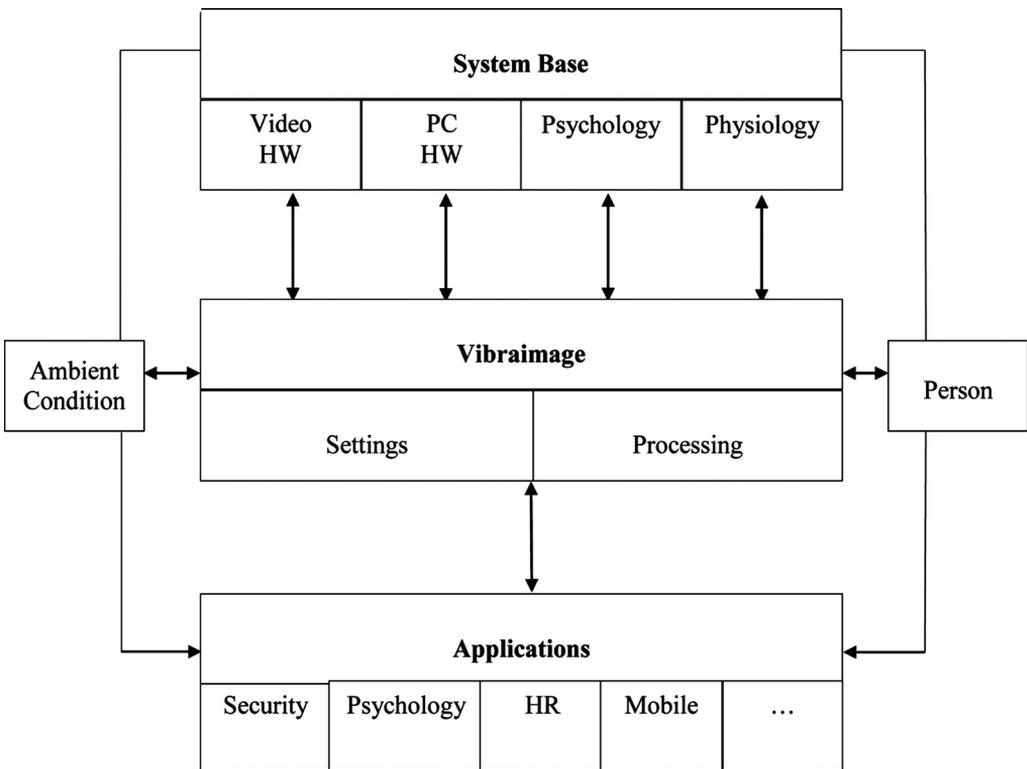
What is the main advantage of vibraimage technology over the other technologies of psychophysiological detection or, more accurately, assessments of a person's psychophysiological state?

First of all, in an unlimited amount of input information about the object of investigation. This allows vibraimage team to constantly increase the power of software processing and add new algorithms simultaneously with the technical progress evolution, increasing the power of processors and improving the quality of television cameras.

Constant increase of program processing opens practically infinite possibilities on development of new applications of vibraimage systems and the received scientific results of a psychophysiological state of the person investigation allow to consider a new level for physical and information psychophysiological processes occurring in a person.

The main problem of vibraimage technology is a large number of feedbacks between the elements used and a large number of internal settings that depend on these links and external conditions.

To clarify these advantages and disadvantages, let's consider the structure diagram of the vibraimage technology, shown in the figure.



**Fig.** Structural scheme of the vibraimage technology

In fact, the vibraimage technology includes only two internal modules — Settings and Processing and the further development of technology is based on the development and modernization of these modules. Of course, every global module indicated on the said figure includes a lot of local modules with a lot of feedbacks between these local modules.

However, the development of these modules should be based on the development and understanding of the System Base and Applications modules, which is not an easy

task, since the System Base includes not only different hardware (Video and PC), but also the understanding of separate psychological and physiological processes, occurring in the object of investigation. Of course, it may seem to somebody that combining hardware modules and human characteristics like Psychology and Physiology into one group (System base) is not correct, but for vibraimage technology, both components are equally important and give equivalent information.

In addition, the Ambient Conditions module always affect to the captured video information and the real vibraimage always differs from the ideal one also because the ambient conditions. The vibraimage captures information about the micromovements of the investigated object and any influence of ambient conditions or hardware noise can distort the analyzing information. Thus, the development of new applications and successful distribution of vibraimage systems in the world is possible only by taking into account the above factors, modules and feedbacks.

These features make certain requirements for local partners of ELSYS Corp, that promote vibraimage technology and vibraimage systems around the world. First of all, it is desirable to constantly train and retrain technical personnel who install and configure vibraimage systems at the facilities of the end user, because of constant upgrades of vibraimage programs and regular appearance of a new products and applications.

I hope that this first scientific and technical conference on vibraimage technology with reports, information exchange and discussions will help to increase the level of its participants and to move development of vibraimage technology throughout the world.

I express my respect and gratitude to all the participants and partners who provided the materials of their research at this conference.

With all discussed advantages and disadvantages, at present, the vibraimage technology is the most famous and the most effective in the world technology of psychophysiological detection and our global task is to achieve wide application of vibraimage technology for solving practical and scientific problems facing humanity. A more accurate and reliable measurement of the person's psychophysiological state will significantly change the world of the future!

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