BUILDING A CLASSIFIER IN THE BIOMETRIC IDENTIFICATION SYSTEM OF AN INDIVIDUAL BASED ON EYE TRACKING DATA

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Identification systems that use biometric characteristics of a person to solve the problem of access to information systems are becoming more widespread. Therefore, a biometric technology was proposed that identifies a person by individual eye movements – behavioral traits. This form of identification is particularly resistant to counterfeiting due to the complex eye movement patterns produced by the brain.

The purpose of this study is to increase the reliability of personality recognition using nonparametric nonlinear dynamic models (Volterra models) of the human oculo-motor system (OMS) when constructing the space of features. The Volterra model in the form of multidimensional transient functions is used for identification.

The object of the research is the process of biometric identification of a person based on eye tracking data. *The subject of the research* is the computational and software tools for the formation of the feature space and the construction of the classifier of individuals based on the results of OMS «input-output» identification based on the Volterra model using the eye tracking technology.

For identity recognition of the individuals based on the OMS nonlinear dynamical model conducted researche:

– Building a feature space for designing classifier of the individe with using machine learning.

– Classifiers construction with using statistical methods of learning the pattern recognition based on the data obtained using eye tracking technology.

There is data of two respondents applied in experimental studies. The discriminant function of the Bayesian classifier is sequentially calculated based on training datasets for object classes Ω_1 (Individual #1 – 22 measuring), Ω_2 (Individual #2 – 16 measuring).

The first, second and third orders transient functions of the OMS were determined based on the data received using the Tobii Pro TX300 eye tracker [1]. As a result, a pair of features was selected that are resistant to computational errors, which gives a high result of the probability of correct recognition – 0,9737.

References.
1. *Pavlenko V., Milosz M., Dzienkowski M.* Identification of the Oculo-Motor System based on the Volterra Model using Eye-tracking Technology // 4th Int. Conf. on Applied Physics, Simulation and Computing (APSAC 2020), 23-25 May 2020, Rome, Italy // Journal of Physics: Conference Series – **Vol. 1603**, 2020. – IOP Publishing, 2020. – P. 1-8.