

ABSTRACT

Relevance. At present, most computer systems and online websites identify users solely by using credentials such as passwords and pins (personal identification numbers). These systems expose their users to identity theft, a crime in which hackers impersonate legitimate users to do fraudulent activities. Hackers use other identities by stealing credentials or by using computers that are logged on that are left unattended.

The main threat to organizations is identity theft committed by internal users who belong to the organization. Usually a hacker gets access to confidential information that can be used for industrial espionage, extortion and the like. The disadvantages of authentication methods that rely only on credentials lead to the introduction of user verification methods that are used in conjunction with identity-based user identification. Verification methods confirm the identity of users in accordance with behavioral and physiological biometrics.

Verification can be performed once during login or continuously throughout the session. In the latter case, the user's biometric measurements are taken at regular intervals when the user logs in and compared with reference data that has been collected in advance. Common behavioral biometrics methods include characteristics of interaction between the user and input devices, such as the mouse and keyboard.

The main drawback of user verification methods that are based on physiological biometrics is that they require special devices, such as a fingerprint sensor and a retinal scanner, which are expensive and not always available. Although fingerprint scanning is becoming more common in laptops, it is still not popular enough and cannot be integrated into web applications. In addition, fingerprints can be copied.

The relevance of this topic is due to the development of new models and methods of user recognition in the CS, which do not require special designed devices, since they use such equipment as a standard manipulator (mouse, touch manipulator, touch screen).

The work is devoted to the construction of new information technology (IT), which provides high-quality user recognition of the computer system (CS) along the trajectories of the mouse cursor using the hidden Markov model (HMM).

The purpose of the dissertation paper determines the necessity of solving the following **tasks**:

- analysis of existing methods of biometric recognition;
- analysis of models and methods of user identification and authentication in computer systems;
- modify methods of hidden Markov models for the best use in the developed system;
- software development;
- the implementation of the algorithms in the software to identify and authenticate users by using the dynamics of the cursor and apart of hidden Markov model.

Object of research - models and methods of user identification in computer systems.

Subject of research - method of identifying the user through the trajectory of the mouse cursor with subsequent authentication.

Research methods. To achieve the tasks, methods of analysis, synthesis, mathematical modeling, numerical methods, information systems modeling, object-oriented analysis and programming are used.

The scientific novelty of the results is to improve the method of authentication of users by using biometric data on the trajectory of the cursor, which unlike existing approaches, extends the functionality of authentication tools, which makes it possible to increase the efficiency of the protection system.

Personal applicant's fee. All scientific results presented in the dissertation are obtained by the competitor personally.

Approbation of the results of the dissertation. The main results of the dissertation work were tested at the following conferences: VII All-Ukrainian Scientific and Practical Conference "Scientific Ukraine: Problems of the Present and Future Prospects"; Scientific and Technical Conference "The actual problems of informatization of management decisions" (APIMD 2018) - Kyiv: NTUU "Igor Sikorsky Kyiv Polytechnic Institute".

Publications The main results of the dissertation research are published in 2 scientific papers, among them: 1 - single; 2 publications - conference materials [1, 2].

BIOMETRIC RECOGNITION, STATISTICAL MODELS, HIDDEN MARKOV MODEL