Behave: An Authentication System Based on Keyboard and Mouse Dynamics

Moscalet, Igor
Chirita, Sandu

Cyber security is a global problem. In 2016, more than 1.3 billion user accounts were stolen using different kind of cyber attacks like phishing, social engineering etc. Login and Password aren't secure enough. The purpose of the project was to design a system which creates a new layer of security taking into account keystroke and mouse dynamics both while the user is authenticating and using the system. For data collection used in neural network training and testing, a web form tracking and storing mouse and keyboard events was built. This research was conducted on 36 people. Additional to parameters used in other similar systems, new parameters of interaction with mouse and keyboard were discovered: press-to-press and release-to-release time. Standard deviation was used for the first time as a separate parameter both for mouse and keyboard. Based on the observation that the intervals between words and letters differ, every parameter was calculated separately for words and letters. These improvements give the network more than 70% success rate and a 0% intrusion rate, It is more efficient than the majority of similar systems because twice less data is needed. The results were implemented in a continuous authentication system working on operating systems. The system was tested by 20 users, being the first open source project of this kind. The conclusion is that user behaviour and interaction with mouse and keyboard can be used as an additional layer of security in terms of securing personal information on computers, websites and electronic systems.

Awards Won:
Oracle Academy: Award of $5,000 for outstanding project in the systems software category.