Cognitive fingerprint authentication system

by

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ABSTRACT

The Internet is becoming an integral part of nearly every aspect of our lives, protecting the identity and personal privacy is crucial for any web organizations. Unfortunately, although technologies such as biometric-based user authentication systems toward the adoption of stronger and more secure authentication schemes have proven superiority over the traditional ones, traditional authentication systems such as username/password are still dominate in computer security systems since biometric-based authentication systems require sophisticated equipments. On the other hand, traditional authentication systems couldn't continuously monitor users after initial login. In this regard, we propose a novel cognitive keystroke authentication that could integrate in the general environment without additional equipment. The proposed system introduces a novel feature extraction algorithm as the cognitive fingerprint, so-called Subword. Our approach combine Subword Searching Algorithm with Weighted Support Vector Machine (WSVM) and Fusion Algorithm to discriminate between impostors and legitimate users with a high success rate. This scheme will continuously monitor the typing behavior of a user and will determine if the current user is still the genuine one or not in the background. Large scale experiment with 800 participants at Iowa State University gives evidence that our approach is feasible in practice, in terms of ease of use, improved security, and performance. The experimental results show that our system can achieve 1.4 percent Equal Error Rate (EER), which demonstrates the systems effectiveness as a new authentication mechanism. Our study define a new feature extraction approach in keystroke dynamics, and we hope our work will inspire researchers looking for another good feature for authentication in keystroke dynamics.