

**MECHATRONICS BOOK SERIES**  
**SELECTED PAPERS FROM**  
**ICOM'01, ICOM'05 AND**  
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# **Intelligent Keystroke Pressure-Based Typing Biometrics Authentication System using Multilayer Feedforward Network**

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## **ABSTRACT**

Security of an information system depends to a large extent on its ability to authenticate legitimate users as well as to withstand attacks of various kinds. Confidence in its ability to provide adequate authentication is, however, waning. This is largely due to the wrongful use of passwords by many users. In this paper, the design and development of keystroke pressure-based typing biometrics for individual user's verification which based on the analysis of habitual typing of individuals is discussed. The combination of maximum pressure exerted on the keyboard and time latency between keystrokes is used as features to create typing patterns for individual users so as to recognize authentic users and to reject impostors. Multilayer feedforward network (MFN), which is one of the artificial neural network, is used as a pattern matching method. The effectiveness of the proposed system is evaluated based upon False Reject Rate (*FRR*) and False Accept Rate (*FAR*). A series of experiment shows that the proposed system is effective for biometric-based security system.

## **1. INTRODUCTION**

Almost all the activities rely on the use of computer technology. Thus, computer has become an integral part of nearly in every aspect of societal activities. The communication, aviation and financial services are already controlled by computer. People entrust with vital information such as medical and criminal records, manage transactions, pay bills and write personal letters. However, this increasing dependency on computers coupled with growing emphasis on global accessibility in cyberspace, has unveiled new threats to computer system security [1]. In addition, crimes and impostors in the cyberspace appear are almost everywhere. Crimes on the computer networks may cause serious damages, including communication blocking, perusal of classified files, commerce information destruction etc [2].

Traditional methods such as passwords and PINs are no longer adequate, as either of these can be cracked, possibly breaking to the computer system. Consequently, alternatives to traditional access control methods are in high demand. Although, a variety of authentication devices to verify a user's identity are in use, password technique has been and will remain the preferred method. Password authentication is an inexpensive and familiar paradigm that most operating systems support. However, the confidence in ability to provide highly secured authentication is weakening. This is largely due to the wrongful use of passwords by many users and to the inhibited simplicity of the mechanism which makes it susceptible to extraordinary intruder attacks. Methods are needed, therefore, to extend and enhance the life of password techniques [3].

A software methodology that improves security by using typing biometrics has been developed to reinforce password-authentication mechanisms [3]. Typing biometric or keystroke dynamics is the analysis of a user's keystroke patterns. This relies on the fact that, each user has a unique way of using the keyboard to enter a password: for example, each user types the characters that constitute the password at different speeds. In developing a scheme using keystroke dynamics for identity verification, it is very necessary to determine which keystrokes characterize the individual's key pattern. Willem et al. [3] employed fuzzy logic to measure the users typing biometric. However there are many adjustable elements such as membership functions and fuzzy rules. Although it has been claimed that many adjustable elements increase the flexibility of the fuzzy-based authentication, they also increase the complexity in designing fuzzy-based authentication system.