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Adaptive Auth - Adaptive Authentication based on User Behaviour for Web Application.

A dissertation by

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Abstract

Authentication can be defined as the process of recognizing the user's identity and it is the most important step in the access control process to safeguard data/resources from being accessed by unauthorized users. At first single factor authentication was introduced to protect the data and verify the identity. Due to the increase in the security vulnerabilities in the single factor authentication two/multi factor authentication has been introduced. Multifactor authentication prevents unauthorized users accessing the system because it involves various authentication factors. But on the other hand, it introduces several other problems on the user experience side. The additional authentication layer reduces the user friendliness/ user experience of a given application and the user has to spend more time to verify the identity in the extra authentication step. In order to overcome this problem adaptive authentication was introduced.

Adaptive Authentication dynamically selects the best authentication option for authenticating a user based on the context factors such as behavioural factors, location, network and some other user attributes. This technology has the capability to change the standard authentication (i.e username/password) procedure and lead the authentication into a more secure and user-friendly manner. Through this research, existing work will be analyzed and an improved adaptive authentication design will be proposed and implemented.

Adaptive Auth provides a novel design of adaptive authentication. Compared to the existing work this research work focuses on both the user behavioural factors and user context factors. Separate machine learning models will be used to identify the user based on the user behavioural and user context factors. A novel approach to improve the performance of the whole authentication process is put forward in this research work. Based on the user's risk profile the authentication mechanisms will be selected. This enhances the user experience of the authentication process.

Keywords: - Adaptive authentication, Machine learning, Performance, Authentication