

Development of a Sequential Multimodal Biometric System for Web-Based Physical Access Control into a Security Safe

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Abstract : The security safe is a place or building where classified document and precious items are kept. To prevent unauthorised persons from gaining access to this safe a lot of technologies had been used. But frequent reports of an unauthorised person gaining access into security safes with the aim of removing document and items from the safes are pointers to the fact that there is still security gap in the recent technologies used as access control for the security safe. In this paper we try to solve this problem by developing a multimodal biometric system for physical access control into a security safe using face and voice recognition. The safe is accessed by the combination of face and speech pattern recognition and also in that sequential order. User authentication is achieved through the use of camera/sensor unit and a microphone unit both attached to the door of the safe. The user face was captured by the camera/sensor while the speech was captured by the use of the microphone unit. The Scale Invariance Feature Transform (SIFT) algorithm was used to train images to form templates for the face recognition system while the Mel-Frequency Cepstral Coefficients (MFCC) algorithm was used to train the speech recognition system to recognise authorise user's speech. Both algorithms were hosted in two separate web based servers and for automatic analysis of our work; our developed system was simulated in a MATLAB environment. The results obtained shows that the developed system was able to give access to authorise users while declining unauthorised person access to the security safe.

Keywords : access control, multimodal biometrics, pattern recognition, security safe

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