

## EEG BIOMETRICS: A FACT NOT FICTION

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Nowadays, automatic identification of the individuality of a person through the use of computers has become an usual issue. The common biometric based approach for this is through the matching of fingerprints. Nevertheless, the field of biometrics remains exciting and actively researched especially for large scale deployments after the continuing threats of terrorism where other biometrics like signatures, voice, palmprint, hand geometry, iris, face, ear force fields, heart signals, and odor have been proposed as an alternative or to augment the fingerprint technology. However, the use of brain signals as a biometric is relatively new and so far has only succeeded in receiving sceptism from the research community until recently. This poster presents results from two recent studies, which show that EEG biometrics is indeed a fact and not a fiction. The first study was conducted on 40 subjects while they were perceiving simple black and white line pictures and the second was conducted with 5 subjects while they were performing some simple mental activities. In both these methods, brain signals i.e. electroencephalograms (EEG) were recorded and subjected through several stages of signal conditioning, feature extraction and intelligent classification. The near perfect results indicate that it is possible to recognise (i.e. identify) the individuality of persons by the use of EEG signals alone. The method works as the mental processes involved in recognising a picture or during some mental activity is different for different individuals and this would be reflected in the EEG recordings. These initial studies have shown the huge potential of using EEG biometrics over existing biometric identification systems, especially for high-security environments as it is impossible to be faked, though unwieldiness in the recording procedure and obtaining time invariant EEG signals are yet to be overcome challenges.

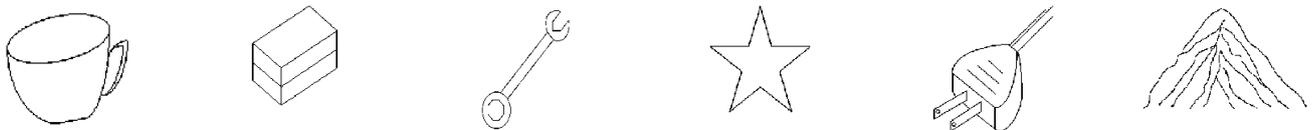


Fig. 1. Some examples of black and white line pictures shown to the subjects in the first study.

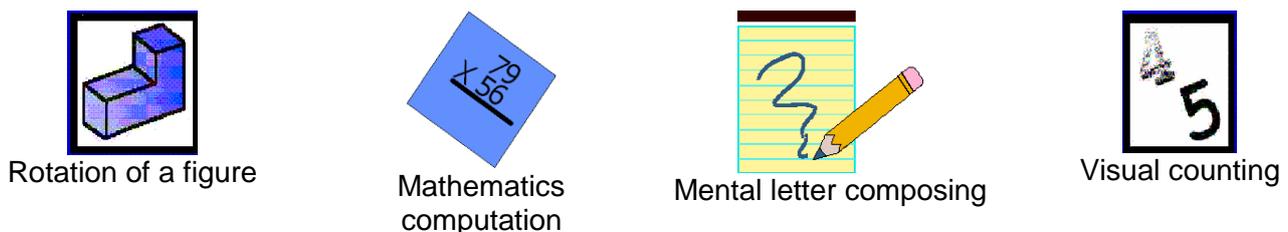


Fig. 2. The four active mental activities performed by the subjects in the second study. The other mental activity was baseline. Note that the subjects imagined these activities without performing any form of action.

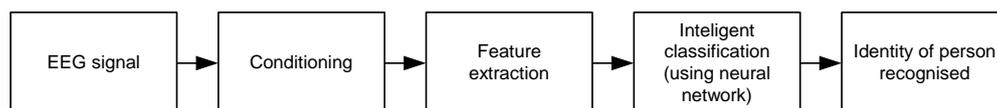


Fig. 3. Block diagram of the EEG biometric approach.