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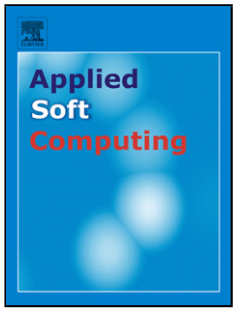

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Real-time Electrocardiogram Streams for Continuous Authentication

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Abstract Security issues are becoming critical in modern smart systems. Particularly, ensuring that only legitimate users get access to them is essential. New access control systems must rely on Continuous Authentication (CA) to provide higher security level. To achive this, recent research has shown how biological signals, such as Electroencephalograms (EEGs) or Electrocardiograms (ECGs), can be useful for this purpose. In this paper we introduce a new CA scheme that, contrarily to previous works in this area, considers ECG signals as continuous data streams. The data stream paradigm is suitable for this scenario since algorithms tailored for data streams can cope with continuous data of a theoretical infinite length and with a certain variability. The proposed ECG-based CA system is intended for real-time applications and is able to offer an accuracy up to 96%, with an almost perfect system performance (kappa statistic $>$ 80%).

Keywords Datastreams · Healthcare · Identification · Electrocardiogram

1 Introduction

Security applications are gaining momentum in modern societies. With the advent of information technologies, data and resources are available almost anytime, anywhere. One key aspect is to ensure that the access to these elements is provided for authorized users only. This need is usually referred to as access control [1].

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