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A comparative analysis of QRS and cardioid graph based ECG biometric recognition in different physiological conditions (Conference Paper)

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Abstract

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This paper performs a comparative analysis of QRS and Cardioid Graph Based ECG Biometric Recognition incorporating Physiological variability. Data was acquired from 30 subjects, where each subject performed six types of physical activities namely walking, going upstairs, going downstairs, natural gait, lying with position changed and resting while watching TV. Then from the signals of these physiological conditions specific features exclusive to each subject were extracted employing the Cardioid graph based model. In this model, features were extracted solely from the graph derived of the QRS complexes. Subjects were recognized with Multilayer Perceptron classification algorithm. Results were obtained through two approaches. Classification was performed on the whole dataset. Cardioid graph based method resulted in 96.4% of correctly classified instances, whereas QRS complex based ECG produced 94.7% accuracy rates. Later, sensitivity and specificity analysis was done to determine the robustness of the model which produced higher outcomes for Cardioid graph based technique of 96.4% and 99.9% respectively. These results suggest that subject identification in different physiological conditions with Cardioid graph based technique produces better classification rates than that of employing only QRS complexes. © 2014 IEEE.

Author keywords

Biometric Cardioid Different physiological conditions ecg QRS

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