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Volume 8, Issue 12, 2016, Pages 67-72

Photoplethysmogram Based biometric identification for twins incorporating gender variability (Article)

Nadzri, N.I.M. , Sidek, K.A.

Department of Electrical and Computer Engineering, Faculty of Engineering, International Islamic University Malaysia, P.O. Box 10, Jalan Gombak, Kuala Lumpur, Malaysia

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Abstract

This study focuses on a Photoplethysmogram (PPG) based biometric identification for twins incorporating gender variability. To the best of our knowledge, little has been said pertaining to this research which identifies twins using PPG signals. PPG device has been widely used due to its advantages such as non-invasive, low cost and small in size which makes it a convenient analytical tool. PPG signals has the capability to ensure the person to be present during the acquisition process which suggest that PPG can provide liveness detection suitable for a biometric system which is not available in other biometric modalities such as fingerprint. A total of four couple of twins which consists of four female and four male subjects in age range between twenty two to thirty years old were used to assess the feasibility of the proposed system. The acquired PPG signals were then processed to remove unwanted noise using low pass filter. After that, multiple cycles of PPG waveforms were extracted and later classified using Radial Basis Function (RBF) and Bayes Network (BN) to categorize the subjects using the discriminant features to calculate and analyze the performance of this system. The outcome also provides a complimentary mechanism to detect twins besides using the current existing methods.

Author keywords

Bayes network (BN); Identical; Photoplethysmogram (PPG); Radial basis function network (RBF)

ISSN: 21801843 **Source Type:** Journal **Original language:** English

Document Type: Article

Publisher: Universiti Teknikal Malaysia Melaka

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