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An efficient secure ECG compression based on 2D-SPIHT and SIT algorithm (Conference Paper)

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Abstract

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The 2D-SPIHT of the Electrocardiogram (ECG) Telehealth system is still be a concern. The performance in the transmission process of the ECG signal data is kept being improved. The ECG signals containing a large-size of health data that must be secured. This research proposes an efficient combination of a compression and an encryption algorithms. Two-Dimension Set Partitioning in Hierarchical Tree (2D-SPIHT) used to optimally compress signals then combined with recently lightweight encryption algorithm, namely Secure IoT (SIT). This approach also proposes new effective encryption stage by just encrypt the most important information of compression signals that is beat-order. Several scenarios were conducted like encrypting the whole bit-stream and combining 2D-SPIHT with another encryption method, Advanced Encryption Standard (AES). The experiment result shows that proposed method gives good performance in compression and encryption. Encrypting successfully produced encrypted data that is highly different data compared to original data. Finally, the combination between 2D-SPIHT and SIT method with encrypting beat-order is the best approach. This got PRD is of 0.650 with compression-encryption-decryption time is of 83.50 seconds. © 2017 IEEE.

Author keywords

(2D-SPIHT) (Compression) (Electrocardiogram) (Encryption) (Secure IoT (SIT) Algorithm)

Indexed keywords

Engineering controlled terms:	(Big data) (Compaction) (Data privacy) (Electrocardiography) (Internet of things) (Medical computing) (Trees (mathematics))
Engineering uncontrolled terms	(2D-SPIHT) (Advanced Encryption Standard) (Decryption time) (Encryption algorithms) (Encryption methods) (Lightweight encryption) (Set partitioning in hierarchical tree) (Telehealth system)
Engineering main heading:	(Cryptography)

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