Subject 優秀論文分享II

醫資系 / 陳碩聰 老師

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題目：Patient Confidential Data Hiding and Transmission System Using Amplitude Quantization in the Frequency Domain of ECG Signals

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摘要：

Abstract: The transform domain provides a useful tool in the field of confidential data hiding and protection. In order to protect and transmit patients' information and competence, this study develops an amplitude quantization system in a transform domain by hiding patients' information in an electrocardiogram (ECG). In this system, we first consider a non-linear model with a hiding state switch to enhance the quality of the hidden ECG signals. Next, we utilize particle swarm optimization (PSO) to solve the non-linear model so as to have a good signal-to-noise ratio (SNR), root mean square error (RMSE), and relative root mean square error (rRMSE). Accordingly, the distortion of the shape in each ECG signal is tiny, while the hidden information can fulfill the needs of physiological diagnostics. The extraction of hidden information is reversely similar to a hiding procedure without primary ECG signals. Preliminary outcomes confirm the effectiveness of our proposed method, especially an Amplitude Similarity of almost 1, an Interval RMSE of almost 0, and SNRs all above 30.