Wavelets and the Fractal Structure of the ECG

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Technology description

Summary

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Description

The detection of ventricular tachycardia, a possibly fatal cardiac arrhythmia, is a critical medical issue. However, using current technologies, doctors can not accurately identify patients at risk for this deadly disease. In response to this critical problem, University of Pennsylvania researchers have developed a novel solution: wavelet analysis, a mathematical tool that decomposes non-linear signals.Under wavelet analysis normal ECG is characterized by certain amplitude and frequency scaling laws. These scaling laws are disrupted in patients with ventricular tachycardia. The scaling deviations reflect a disturbance in the fractal spread of activation in the myocardium in these patients.

Application area

Researchers have been able to detect ventricular tachycardia using wavelet analysis on ECG signals, electrical activity measurement of the heart, and QRS signals, depolarization measurement of the ventricles.

Institution

University of Pennsylvania

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