Universidad de Alcalá

DEVICE AND METHOD FOR VENTRICULAR REPOLARIZATION ALTERNANS DETECTION BY WINDOWING

Patent
ES343054 B2

Code

BIO_UAH_15

Application areas

- Information and Communication Technologies
- Other Industrial Technologies
- Biological Sciences, Health and Pharma

Type of Collaboration

- Technical cooperation
- License agreement
- Commercial agreement with technical assistance

Main Researchers

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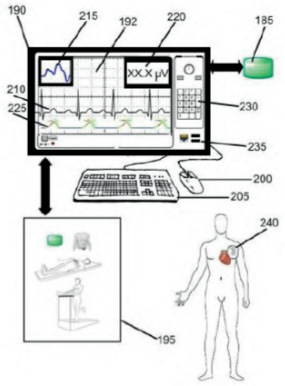

ABSTRACT

The designed scheme consists of the following:

1. Extraction and / or storage of the electrocardiogram (ECG)
2. Adaptation of the signal and elimination of noise and artifacts
3. Extraction of information of T-wave alternans (TWA) using the synthesis of a periodical window and the windowing of the signal
4. Post-processing for improving TWA detection
5. Detection of TWA from RAOT calculation and decision
6. Presentation of the results for estimating the TWA may be one or more of the following:
   - The Value of the power estimation, which may be in voltage units
   - Superposition of ventricular repolarization in order to visually identifying alternans
   - The estimated waveform of the alternating wave
7. Output Interface that transmits information to a user, to another processing stage or a device, about the existence or nonexistence of TWA in the signal.

ADVANTAGES AND INNOVATIONS

- The ECG is processed in the time domain.
- It is based on spectral analysis, using the ECG as an original signal sin the analysis.
- A small number of heart beats is used in the analysis, from 8 to 32.
- It is robust against noise, being valid for the analysis of any type of electrical signal of the heart from any existing device, like Holter monitoring long term, signals from exercise testing, cardiac monitoring devices or intracavitary signals from electrophysiological studies or implantable devices.

Using a reduced number of beats in the analysis:

- The variability effect of heart rate decreases.
- The resolution of the analysis improves.
- The computational cost is reduced, making it valid for implementation into any existing device, including portable or implantable devices.