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## Research Letter

## Using Multiscale Product for ECG Characterization

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Abstract

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## Abstract

This paper introduces a new method for R wave's locations using the multiscale wavelet analysis, that is based on Mallat's and Hwang's approach for singularity detection via local maxima of the wavelet coefficients signals. Using a first derivative Gaussian function as prototype wavelet, we apply the pointwise product of the wavelet coefficients (PWCs) over some successive scales, in order to enhance the peak amplitude of the modulus maximum line and to reduce noise. The R wave corresponds to two modulus maximum lines with opposite signs (min-max) of multi-scale product. The proposed algorithm does not include regularity analysis but only amplitude-based criteria. We evaluated the algorithm on two manually annotated databases, such as MIT-BIH Arrhythmia and QT.