

## A new semantic mining approach for detecting ventricular tachycardia and ventricular fibrillation

### Abstract

Accurately differentiating between ventricular fibrillation (VF) and ventricular tachycardia (VT) episodes is crucial in preventing potentially fatal misinterpretations. If VT is misinterpreted as VF, the patient will receive an unnecessary shock that could damage the heart; conversely, if VF is incorrectly interpreted as VT, the result will be life-threatening. In this study, a new method called semantic mining is used to characterize VT and VF episodes by extracting their significant characteristics (the frequency, damping coefficient and input signal). This newly proposed method was tested using a widely recognized database provided by the Massachusetts Institute of Technology (MIT) and achieved high detection accuracy of 96.7%. The semantic mining technique was capable of completely discriminating between normal rhythms and VT and VF episodes without any false detections and also distinguished VT and VF episodes from one another with a recognition sensitivity of 94.1% and 95.2% for VT and VF, respectively.