# A novel approach for QRS complex detection in patients with atrial arrhythmia


## Abstract

Atrial fibrillation (AF) is the most common cardiac arrhythmia in the world which shows rising prevalence leading to increased comorbidities, such as, Ischemic heart disease and Stroke that the main cause of deaths in the world. Since AF and most of the arrhythmias are generated due to electrical problems at the heart, electrocardiography provides the best noninvasive method to diagnose and QRS complex play an important role as a benchmark. In this paper, a novel methodology for QRS complex detection is presented. The algorithm introduces a modification of the well known Pan Tompkins approach, performing a multi channel detection, based on the signal to noise ratio of every channel. After application of the squaring operation in the channels with the highest signal to noise ratio a new single channel is created with improved quality, allowing the accurate detection of the QRS complexes in signals with atrial arrhythmias. The approach was tested in electrocardiography records from the Hospital Universitario de Valencia in Spain, showing an average positive predictive value of 99.6% and an average sensitivity of 99.9%.