IMPROVING THE ABILITY OF MATCHING PURSUIT ALGORITHM IN DETECTING SPIKES (ThuAmPO3)

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Abstract :

Detection of signal transients, or spikes, is a suitable application of time−frequency signal processing. One such time−frequency method for spike detection is matching pursuit, incorporating a redundant time−frequency dictionary. However, problems arise when using matching pursuit to detect repetitive rhythmical spiking, which is a common characteristic in an application such as newborn EEG seizure detection. In this paper we investigate the ability of matching pursuit to detect spikes both in synthetic signals and real newborn EEG seizure. It is shown that repetitive spikes may be recognised by matching pursuit as harmonic patterns rather than individual spikes. Consequently, these spikes cannot be located in the matching pursuit time−frequency domain representation. However, we have found that the relationship between the length of a repetitive spike sequence and interval between successive spikes in the sequence plays a pivotal role in the ability of matching pursuit to detect these spikes.

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