

ABSTRACT

Polysomnography is one method used to diagnose some kind of disease. It is a multi-parametric test used in the study of sleep. One of the parameter used for polysomnography is the muscle activity. Logically, motion activity will cause motion. Some examples of sleep disorder are restless legs syndrome and sleep apnea.

Motion detection is a way to sense motion. Patient with some sleep disorder moves more often than someone who doesn't. Motion detection application for polysomnography records movements, occurred time, and its duration. The methods used to detect motion are frame difference, correlation, and $\Sigma - \Delta$ background estimation by A. Manzanera dan J. C. Richefeu.

The result of this research is the threshold that can be used to detect some kind of movements during sleep. Threshold is the minimum value to decide whether the movement will be recorded or not. The threshold for frame difference and $\Sigma - \Delta$ can be achieved by comparing the sum of the moving pixel and the screen resolution. For example, 0.8 in threshold means that 80% of the screen is moving. In correlation algorithm, the threshold is the two dimensional correlation result of two sequencing frame. Big movement such as rolling is easier to detect since it gives bigger difference of motion between frames than its noise. Frame difference algorithm gives the best result since it is more resistant to noise and relatively small noise variance. Frame difference can detect 24 of 32 video used, more than correlation or $\Sigma - \Delta$ method.

Keyword: motion detection, polysomnography, background subtraction