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Final report

Epilepsy seizure detection using multisensors

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1 Introduction

1.1 Context

Our project...

1.2 About the situation

Let $X1, ...Xn$ independant and identically distribued random variables with a mean μ and a standard deviation σ. We denote $\bar{X}_n = n^{-1} \sum_{i=1}^{n} X_i$. Then the law of $\frac{\bar{X}_n - \mu}{\sigma/\sqrt{n}}$ tends to the reduced central normal law. This is also written : for all a and b real numbers,

where Z is a reduced centered Gaussian variable, $Z \sim \mathcal{N}(0, 1)$

Algorithm 1: quantization

Result: *quantized* : the data quantized
Data: *data* : One feature of an activity (a matrix), TS : a threshold
quantized $\leftarrow$ [];
foreach $data_{i,j}$ *in data* **do**
    if $data_{i,j} \geq TS$ *or* $data_{i,j} \leq -TS$ **then**
        $quantized_{i,j} = 1$;
    end
    else
        $quantized_{i,j} = 0$;
    end
end

$S_{n+1} = max(0, S_n + X - \omega_n)$

$$Z = \frac{X - \mu}{\sigma}$$

Algorithm 2: CUMSUM

Result: A boolean if there is an abrupt changing
Data: X : a Gaussian distribution, TS : a threshold, ω : a weight
$n = 0$;
$S_n = 0$;
while $S_n < TS$ **do**
    if $n == length(X)$ **then**
        return false;
    end
    $S_n = max(0, S_n + X - \omega)$;
    $n = n + 1$;
end
return true;