Definition 1 *An EEG is a* 3*-uple* $E = (S, f_s, \Omega)$ *where* $S \in \mathbb{N}$ *is the number of samples in each signal,* $f_s \in \mathbb{N}$ *is the sampling rate of the signals, and* $\in S \times k$ *is the signal matrix.*

In general, EEG signals are interpreted by epochs of length $L_e \in \mathbb{N}$ seconds, which are sometimes in its turn divided in m subepochs. Of course,

$$S = L_e f_s N_e$$

where N_e is the number of epochs in the EEG. From which follows that

$$N_e = \frac{S}{L_e f_s}$$

Since an epoch refers to a certain portion of the EEG in the temporal dimension, it is useful to model an epoch e as follows.

Definition 2 *Let* $E = (S, f_s, \Omega)$ *an EEG. An epoch* $e : \mathbb{N} \longrightarrow \mathbb{N}^2$ *is defined as*

$$e(n) = \Big((n-1)L_e f_s + 1,\ nL_e f_s\Big)$$

This definition is such that if $e(n) = (l, u)$ then every row Ω_{i*} with $l \leq i \leq u$ corresponds to a record within the nth epoch, or rather that the nth epoch consists of the signals $\Omega_{l*}, \Omega_{(l+1)*}, \ldots, \Omega_{u*}$.

We may overload this convention and let $e(n, m) = ((n-1)\, L_e f_s, mL_e f_s)$ and take $e(n)$ to be simply the case $e(n, n)$. Thus, $e(n, m)$ is the 2-uple with the lower and upper bounds of all rows in Ω corresponding to epochs $n, n+1, \ldots, m$.