Discriminability

writeLaTeX

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1 Discriminability

Algorithm 1 Discriminability: A measure of intra-subject consistency and inter-subject differentiation. We want to see that after an implemenation

Input: $X \in \mathbb{R}^{C\times N\times T\times S}$ EEG Data (format $electrode \times time \times trial \times subject$)
Input: $\delta : \mathbb{R}^{C\times N}, \mathbb{R}^{C\times N} \to \mathbb{R}$ a distance function
Output: $D \in \mathbb{R}$ value between 0 and 1, discriminability

procedure DISCRIMINABILITY($\mathcal{X}, \delta$)
    $tot = 0$ ▷ set total of rdfs to 0
    for $s \in S$ **do**
        $tot+ = rdf(X, \delta, s)$
    return $\frac{tot}{S\times T\times(T-1)}$

Algorithm 2 Reliability Density Function: Comparison of difference for given subject of 2 given trials vs the difference between other subjects and their trials

Input: $X \in \mathbb{R}^{C\times N\times T\times S}$ EEG Data (format $electrode \times time \times trial \times subject$)
Input: $\delta : \mathbb{R}^{C\times N}, \mathbb{R}^{C\times N} \to \mathbb{R}$ a distance function
Input: $s : \mathbb{R}$ subject
Output: $\hat{D} \in \mathbb{R}$ value between 0 and 1, "reliability density" for given conditions

procedure RDF(X, δ, s)
    $rdf = 0$ ▷ set rdfs to 0
    for $s' \in S$ **do**
        for $t \in T$ **do**
            for $t' \in T$ **do**
                if $t \neq t'$ and $s \neq s'$ **then**
                $rdf+ = 1 - \mathbb{I}(\delta(X_{t,s}, X_{t',s}) < \delta(X_{t,s}, X_{t',s}))$
    return $\frac{rdf}{(S-1)\times T\times(T-1)}$