



Determinant characteristics in EEG signal based on bursts amplitude segmentation for predicting pathological outcomes of a premature newborn, with validation using ANN

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Auteur	Alhajjar, Yasser [1], Al Hajjar, Abd El Salam Ahmad [2], Daya, Bassam [3], Chauvet, Pierre [4]
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Mots-clés	Artificial neural network [5], EEG signal [6], EEG signal characteristics [7], inter-burst interval IBI [8], prediction [9]
Résumé en anglais	<p>EEG signal contains some specific patterns that predict neuro-developmental impairments of a premature newborn. Extracting these patterns from a set of EEG records provides a dataset to be used in machine learning in order to implement an intelligent classification system that predict prognosis of the baby. In a previous work we proved that inter-burst intervals (IBI) found in the EEG records predicts abnormal outcomes of the premature. A bibliographic study on the amplitude of an EEG signal, with the annotations of the neuro-pediatricians, showed that low amplitudes in EEG signal are strongly correlated with an abnormal prognosis of the premature, similar to that of IBI. According to these hypotheses, we present in this paper, a segmentation methodology on the amplitude of bursts intervals of EEG signal into 3 segments: low, medium and high, in addition to the inter-burst intervals. We create a new algorithm that detects 6 important parameters in each interval of these 4 segments. After applying this new methodology, we obtain a new classified dataset that contains 24 parameters extracted from these 4 segments to obtain with gestational age of the preterm and the day of recording 26 input attributes and one output which is the class (normal, sick or risky). Finally we validate the pertinence of these attributes using artificial neural network.</p>
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Liens

[1] <http://okina.univ-angers.fr/yalhajjar/publications>

[2] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=28383>

[3] <http://okina.univ-angers.fr/publications?f%5Bauthor%5D=2091>

[4] <http://okina.univ-angers.fr/pierre.chauvet/publications>

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