



Identifying brain abnormalities from electroencephalogram using evolutionary gravitational neocognitron neural network

P. Gomathi¹ · S. Baskar² · P. Mohamed Shakeel³ · V. R. Sarma Dhulipala⁴

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Abstract

Now-a-day's brain abnormality is one among the dangerous neurological disorders that occurs because of the birth defects, brain stroke, brain injuries, genetic mutation and brain tumor. This brain disorder creates continue melancholia, bipolar disorder, stress disorder (PTSD) and so on. Due to this serious impact of the brain abnormalities, need to be identified within the beginning stage for eliminating the difficulties in humans day to day life. So, the automatic brain abnormality prediction process is created by utilizing electroencephalogram (EEG) for avoiding risk factor in future. As per the discussion, this paper introduces the evolutionary gravitational Neocognitron neural network(GNNN) for recognizing brain abnormalities with effective manner and it is especially suited for humans in war field. Initially, EEG signal is collected from patient; unwanted signal information is eliminated by using multi-linear principal component analysis from pre-processed signal, various features are extracted using affine invariant component analysis method and greedy global optimized features are chosen. The chosen features are analyzed using multi-layer virtual cortex model for predicting abnormal features. Finally the potency of the brain related abnormality prediction process developed using MATLAB tool and efficiency is examined using F-measure, Mathew correlation coefficient error rate, sensitivity, specificity, and accuracy. Along these lines the proposed framework effectively perceives the cerebrum variation from the norm with most astounding precision up to 99.48% with error rate.

Keywords Brain abnormality · Electroencephalogram (EEG) · Multi-linear principal component · Affine invariant component analysis · Multi-layer virtual cortex · Mathew correlation coefficient and accuracy

1 Introduction

In this century most of the people willing to live their life according to the modern lifestyle such as food, games, electronic gadget and so on. Due to the rapid changes in their lifestyle

✉ P. Gomathi
gomathimd@gmail.com