

Risk related prediction for recurrent stroke and post-stroke epilepsy using Fractional Fourier Transform analysis of EEG signals

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Abstract: Stroke is a medical condition which can easily affect the quality of life, depending on how extended the stroke is and what regions of the brain are involved. According to the most recent data cited in WHO, Romania is in top three of the countries with increased frequency of stroke and has the second place for having the most deaths and disabilities caused by stroke. Actually, stroke is the second death cause in Romania after cardiac arrest. Today, there are various prevention methods concerning stroke. The hypothesis of the research context is that EEG signal can provide useful information on risk related prediction for recurrent stroke and post-stroke epilepsy. Knowing that there is a certain risk on developing secondary epilepsy after stroke, based on the EEG rhythms, may help in prevention and maybe in reconsidering a new approach in the treatment of this pathology. On the other hand Fractional Fourier Transform (FFT), a generalization of conventional Fourier Transform, is used with success in many applications like detection of signals in noise, image compression, reduction of side lobe levels using convolutional windows, time-frequency analysis, etc. It can be used in more effective manner compared to Fourier transform with additional degrees of freedom. That was the motivation to analyze the spectra of each component of the EEG signals using FFT in order to predict recurrent stroke and post-stroke epilepsy incidence. The results prove the efficiency of the method.

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