عنوان مقاله:

Neural Spike Sorting Using Wavelet Coefficients, Unsupervised Fuzzy Clustering and Improved Mathematical Morphology Filtering

محل انتشار:

بیستمین کنفرانس مهندسی برق ایران (سال: 1391)

تعداد صفحات اصل مقاله: 6

نویسندگان:

M Babakmehr - *AUT University*

Sh Gharibzadeh - *AUT University*

F Almasganj

خلاصه مقاله:

In this paper we present an unsupervised method in order to extract single-cell neural activity from simultaneous extracellular activity of unknown number of neural cells; a problem known as neural spike sorting. In this study neural spikes are initially separated from the signal, using a Mathematical morphology filtering. Then, discrete waveletcoefficients of the separated spike templates are extracted using Daubechies2 mother wavelet. Afterwards, feature selection isdone utilizing a statistical test. Finally, the unsupervised optimal fuzzy clustering is used in order to classify each of neural spiketemplates to its generating neuron. In literatures the capabilities of the Optimal fuzzy clustering method for classifying clusters that are heterogeneous in shape and density, have been shown. We evaluate our method’s performance using synthetically generated spike trains from real spike templates in a wide rangeof signal-to-noise ratios and compare our results with the RBF neural networks, ordinary fuzzy k-means, wavelet based k-meansand Wave-Clus method

کلمات کلیدی:

Extracellular recording , spike sorting, fuzzy clustering, wavelet decomposition, MathematicalMorphoilogy