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Abstract:

Much experimental study of real neural networks relies on the proper classification of extracellulary sampled neural

signals (i .e. action

potentials) recorded from the brains of ex(cid:173) perimental animals. In most neurophysiology laboratories this

classification task is simplified by limiting

investigations to single, electrically well-isolated neurons recorded one at a time. However, for those interested in

sampling the activities of

many single neurons simultaneously, waveform classification becomes a serious concern. In this paper we describe and

constrast three approaches to

this problem each designed not only to recognize isolated neural events, but also to separately classify temporally

overlapping events in

real time. First we present two formulations of waveform classification using a neural network template matching

approach. These two formulations

are then compared to a simple template matching implementation. Analysis with real neural signals reveals that simple

template matching is

a better solution to this problem than either neural network approach.