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Neural network method for identification of earthquake phases in increased noise level conditions

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Automatic identification of earthquake phases, especially the first arrivals, in a record aggravated by numerous noises of manmade origin is a problem of current interest for early warning systems based on a single sensor. In that case the seismic sensor should be installed at the end user, that is, frequently at places having increased noise levels and little protection from noise. The noise may be very diverse, from stationary to impulsive. It thus becomes justified to make use of neural-network methods for signal classification. If data processing and information transmission can be performed very quickly (that is, within 4-5 seconds), then such an earthquake warning will be valuable in terms of reducing the loss of human life and property.
The present paper considers questions arising in choosing representations of signals incorporating hardware implementation of a self-contained warning system. Special attention is being paid to the separability of feature vectors in the feature space and possible dimensionality reduction.