

PATTERN RECOGNITION TECHNIQUES FOR BREAST CANCER PREDICTION

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Electrical impedance spectroscopy is a minimal invasive technique that has clear advantages for living tissue characterization owing to its low cost and eases of use. The present paper describes how this technique can be applied to breast tissue classification and breast cancer detection.

We consider nine features computed from the impedance spectrum of the freshly excised tissue from the breast. The spectrum is based on the impedance measurements made at seven frequencies (from 15.625 till 1000KHz) in a sample of breast tissue.

The target t is the class in which the excised tissue is discriminated (six classes).

The training set contains 106 cases of breast tissue.

Based on this features a Learning Vector Quantization (LVQ) network is trained to learn t . In order to tune the LVQ network, a competitive algorithm is used to minimize the number of neurons on the hidden layer.

Comparatively with other statistical methods (i.e. discriminant analysis and classification trees) results of LVQ classification show an overall classification efficiency varying from 77% to 100% depending on the parameters of the LVQ network.