

Locally Weighted Neural Networks for an Analysis of the Biosensor Response

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Abstract: This paper presents a semi-global mathematical model for an analysis of a signal of amperometric biosensors. Artificial neural networks were applied to an analysis of the biosensor response to multi-component mixtures. A large amount of the learning and test data was synthesized using computer simulation of the biosensor response. The biosensor signal was analyzed with respect to the concentration of each component of the mixture. The paradigm of locally weighted linear regression was used for retraining the neural networks. The application of locally weighted regression significantly improved the quality of the prediction of the concentrations.

Keywords: locally weighted regression; artificial neural network; modelling; biosensor;

AMS Subject Classification: 62J12; 68T05; 92C45;

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