

# Feature Extraction Methods for Electronic Nose Responses

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*This paper reports about feature extraction methods from the original dynamic responses of electronic nose sensors. The aim of feature extraction methods in this research is to extract the information about quantitative changes of oils oxygenated volatile compounds. This paper presents a novel and well-known approaches and algorithms of feature extraction, such as extraction from the original responses, log-normal and polynomial curve fitting parameters, recognition of odor fingerprints based on selected times of sensor array responses as representatives. Optimized mathematical models and new algorithms for data extraction and compression into a structured part is shown to significantly enhance the performance of subsequent the partial least squares regression. The most accurate calibration models pretended for prediction of quality (peroxide value) of new vegetable oils samples were obtained with log-normal parameters such as asymmetry and width of response curves and with new geometric parameters for recognition the odor fingerprints such as star coefficient, the coefficient of non-smoothness and the perimeter of a polygon.*

*The proposed approach of evaluation the peroxide value of vegetable oils using algorithm of recognition the odor fingerprints in combination with partial least squares regression allows for fast analysis of samples quality with a relative error of about 8%.*

**Keywords:** response curve, feature extraction, electronic nose, curve fitting, quartz-microbalance sensors, partial least squares regression