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A novel method for the interpretation of spectrometer signals based on delta-modulation and similarity determination

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For the application of mass spectrometry in different areas the automatic intelligent spectrometer signal analysis methods are necessary. These methods should be robust and machine learnable automatic signal interpretation methods. These methods should be taken into account that not so much spectrometer data about the application are available from scratch and that these data need to be learnt while using the spectrometer system. We propose to represent the spectrometer signal by a sequence of 0/1 characters obtained from a specific delta modulator. This prevents us from a particular symbolic description of peaks and background. The interpretation of the spectrometer signal is done by searching for a similar signal in a constantly increasing data base. The comparison between the two sequences is done based on a syntactic similarity measure. We describe in this paper how the signal representation is obtained by delta modulation, the similarity measure for the comparison of the signals and give results for searching the data base.

Biography

Petra Perner is the Director of the Institute of Computer Vision and Applied Computer Sciences IBAI. (IAPR Fellow) She received her Diploma Degree in Electrical Engineering and her PhD Degree in Computer Science for the work on Data Reduction Methods for Industrial Robots with Direct Teach-in-Programming. Her habilitation thesis was about "A Methodology for the Development of Knowledge-Based Image-Interpretation Systems". She has been the Principal Investigator of various national and international research projects. She received several research awards for her research work and has been awarded with three business awards for her work on bringing intelligent image interpretation methods and data mining methods into business. Her research interest is image analysis and interpretation, machine learning, data mining, big data, machine learning, image mining and case-based reasoning.

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