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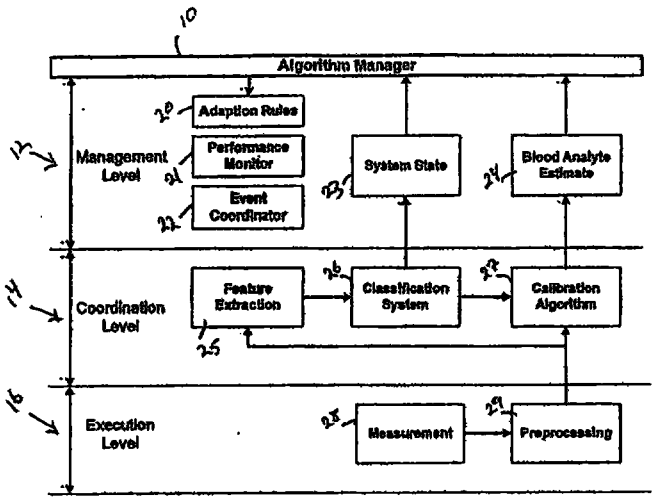
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(54) Title: SYSTEM AND METHOD FOR NONINVASIVE BLOOD ANALYTE MEASUREMENTS



(57) Abstract

An intelligent system for measuring blood analytes noninvasively operates on a near infrared absorbance spectrum of *in vivo* skin tissue. A hierarchical architecture employs a pattern classification engine to adapt the calibration to the structural properties and physiological state of the subject as manifested in the absorbance spectrum. A *priori* information about the primary sources of sample variability are used to establish general categories of subjects. By applying calibration schemes specific to the various categories, the spectral interference is reduced resulting in improved prediction accuracy and parsimounious calibrations. Two classification rules are disclosed. The first rule assumes the classes are mutually exclusive and applies specific calibration models to the various subject categories. The second rule uses fuzzy set theory to develop calibration models and blood analyte predictions. Therefore, each calibration sample has the opportunity to influence more than one calibration model according to its class membership. Similarly, the predictions from more than one calibration are combined through defuzzification to produce the final blood analyte prediction.