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Computer-aided diagnosis bringing changes in breast cancer detection

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Abstract : Regardless of the many technologic advances in the past decade, increased training and experience, and the obvious benefits of uniform standards, the false-negative rate in screening mammography remains unacceptably high .A computer aided neural network classification of regions of suspicion (ROS) on digitized mammograms is presented in this abstract which employs features extracted by a new technique based on independent component analysis.

CAD is a concept established by taking into account equally the roles of physicians and computers, whereas automated computer diagnosis is a concept based on computer algorithms only. With CAD, the performance by computers does not have to be comparable to or better than that by physicians, but needs to be complementary to that by physicians. In fact, a large number of CAD systems have been employed for assisting physicians in the early detection of breast cancers on mammograms.

A CAD scheme that makes use of lateral breast images has the potential to improve the overall performance in the detection of breast lumps. Because breast lumps can be detected reliably by computer on lateral breast mammographs, radiologists' accuracy in the detection of breast lumps would be improved by the use of CAD, and thus early diagnosis of breast cancer would become possible. In the future, many CAD schemes could be assembled as packages and implemented as a part of PACS. For example, the package for breast CAD may include the computerized detection of breast nodules, as well as the computerized classification of benign and malignant nodules. In order to assist in the differential diagnosis, it would be possible to search for and retrieve images (or lesions) with these CAD systems, which would be reliable and useful method for quantifying the similarity of a pair of images for visual comparison by radiologists.