

A Highly Accurate Computer-Aided Diagnosis: CAD System for the Diagnosis of Breast Cancer by Using Thermographic Analysis

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Abstract : Computer-aided diagnosis (CAD) systems can play crucial roles in diagnosing crucial diseases such as breast cancer at the earliest. In this paper, a CAD system for the diagnosis of breast cancer was introduced and evaluated. This CAD system was developed by using spatio-temporal analysis of data on a set of consecutive thermographic images by employing wavelet transformation. By using this analysis, a very accurate machine learning model using random forest was obtained. The final results showed a promising accuracy of 91% in terms of the F1 measure indicator among 200 patients' sample data. The CAD system was further extended to obtain a detailed analysis of the effect of smaller sub-areas of each breast on the occurrence of cancer.

Keywords : computer-aided diagnosis systems, thermographic analysis, spatio-temporal analysis, image processing, machine learning

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