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Analysis and separating of breast cancer tumors in thermal images using active contours and asymmetry Techniques

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Abstract

Background: Breast Cancer is one of the most common diseases among women, and its early detection considerably causes the improvement of treatment and recovery process. Thermal imaging is a non-invasive, passive, low cost, and fast method and this technique performs without touch, radiation, and pain. Therefore, this method has attracted much attention of researchers. In this study, the analysis of asymmetry technique on thermal images and isolating of cancerous areas using active contour is investigated.

Methods: Images examined in this study are collected by the thermal camera during a period of 4 months, in collaboration with the Medical University of Sabzevar. In this study the detection and isolation of breast cancer tumors using thermal features in the images is discussed. It has been attempted to diagnose breast cancer with considerably accuracy by the means of image processing techniques such as asymmetry property and arterial intelligent. In images including tumors, the active contour is used to separate the tumors.

Results: The study was conductedon180people whovolunteeredtobetested.14 cases out of 180 cases suffer from chronic fibroid and one case is breast cancer. In this study fibroids with low size and low volume are also obviously visible. Techniques and points which empirically but based on scientific principles have been obtained in this research can help physicians to reduce the diagnosis errors in the analysis of thermal images. Comparison of the separation accuracy of the cancerous tissues by using active contour between mammography and thermal imaging in people who suffer from cancer has shown that thermal imaging method outperforms in terms of the accuracy.

Conclusion: The results in this study indicate that thermal images by the combination of artificial intelligence based on proposed method could play a special role in breast cancer screening due to no harmful radiation and high accuracy.

Keywords: Breast Cancer Diagnosis, Infrared Thermal Images, Active Counter.