A Breast Cancer Diagnosis System using Hybrid Case-based Approach

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Abstract

Nowadays, mammography is recognized as the most effective technique for breast cancer diagnosis. Case-Based Reasoning (CBR) is one of the important techniques used to diagnose the breast cancer disease. The retrieval-only CBR systems do not provide an acceptable accuracy in critical domains such as medical. In this paper, a new breast cancer diagnosis system using hybrid case-based approach is presented to improve the accuracy of the retrieval-only CBR systems. The approach integrates case-based reasoning and rule-based reasoning, and applies the adaptation process automatically by exploiting adaptation rules. Both adaptation rules and reasoning rules are generated automatically from the case-base. After solving a new case, the case-base is expanded, and both adaptation and reasoning rules are updated automatically. To evaluate the proposed approach, a prototype was implemented and experimented to diagnose the breast cancer disease. The final results showed that the proposed approach increases the diagnosing accuracy comparing with the retrieval-only CBR systems, and provides a reliable accuracy comparing to the current breast cancer diagnosis systems.
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Index Terms

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- Adaptation rules
- Breast cancer diagnosis
- Mammography