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.
References

- Marling, C., Shubrook, J., & Schwartz, F. 2008. Case-based decision support for patients with type 1 diabetes on insulin pump therapy. In Advances in Case-Based Reasoning
A Breast Cancer Diagnosis System using Hybrid Case-based Approach

(p. 325-339). Springer Berlin Heidelberg.


Elter, M., Schulz-Wendtland, R., & Wittenberg, T. 2007. The prediction of breast cancer biopsy outcomes using two CAD approaches that both emphasize an intelligible decision process. Medical Physics, 34, 4164.

A Breast Cancer Diagnosis System using Hybrid Case-based Approach

212(3), 817-827.

Index Terms
Computer Science
Artificial Intelligence

Keywords
Case-based reasoning (CBR) Rule-based reasoning (RBR) Adaptation rules
Breast cancer diagnosis
Mammography