

عنوان مقاله:

A Fuzzy Rule-based Expert System for the Prognosis of the Risk of Development of the Breast Cancer

محل انتشار:

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خلاصه مقاله:

Soft computing techniques play an important role for decision-making applications with imprecise and uncertain knowledge. The application of fuzzy soft computing applications is rapidly emerging in the medical diagnosis and prognosis. A fuzzy expert system models knowledge as a set of explicit linguistic rules and performs reasoning with words. Although there are several technology-oriented studies reported for breast cancer diagnosis, few studies have been reported for the breast cancer prognosis. However, prognosis of breast cancer suffers from uncertainty and imprecision associated to imprecise input measures and incompleteness of knowledge as well as diagnosis. This research presents a fuzzy expert system for breast cancer prognosis. This approach is capable enough to capture ambiguity and imprecision prevalent in the characterization of the breast cancer. For this, the paper utilizes a Mamdani fuzzy inference model, which is more intuitive and has high interpretability for interacting with human experts during prognosis process. The main advantage of this work compared to other related studies, mostly presented for assessing the risk of the cancer development stage, is using unbiased input variables in the prognosis process; i.e., this model has the potential to predict the risk of developing breast cancer even in healthy females. Furthermore, the fuzzy expert system was evaluated on real dataset and the results of system were compared to an obstetrician decisions. The performance results on real dataset reveals superiority of the fuzzy expert system in the prognosis process with an average accuracy of 95%, compared to other related works. This approach is optimistic for prediction of breast cancer risk and early diagnosis of the cancer and can consequently improve survival rate

کلمات کلیدی:

Soft Computing Fuzzy Expert System Breast Cancer Prognosis

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