عنوان مقاله:

Development of an Ensemble Multi-stage Machine for Prediction of Breast Cancer Survivability

محل انتشار:

مجله هوش مصنوعی و داده کاوی, دوره 8, شماره 3 (سال: 1399)

تعداد صفحات اصل مقاله: 9

نویسندگان:

.M. Salehi - *Department of Computer Science, Faculty of Mathematical Sciences, University of Tabriz, Tabriz, Iran*

.J. Razmara - *Department of Computer Science, Faculty of Mathematical Sciences, University of Tabriz, Tabriz, Iran*

.Sh. Lotfi - *Department of Computer Science, Faculty of Mathematical Sciences, University of Tabriz, Tabriz, Iran*

خلاصه مقاله:

Prediction of cancer survivability using machine learning techniques has become a popular approach in recent years. In this regard, an important issue is that preparation of some features may need conducting difficult and costly experiments while these features have less significant impacts on the final decision and can be ignored from the feature set. Therefore, developing a machine for prediction of survivability, which ignores these features for simple cases and yields an acceptable prediction accuracy, has turned into a challenge for researchers. In this paper, we have developed an ensemble multi-stage machine for survivability prediction which ignores difficult features for simple cases. The machine employs three basic learners, namely multilayer perceptron (MLP), support vector machine (SVM), and decision tree (DT), in the first stage to predict survivability using simple features. If the learners agree on the output, the machine makes the final decision in the first stage. Otherwise, for difficult cases where the output of learners is different, the machine makes decision in the second stage using SVM over all features. The developed model was evaluated using the Surveillance, Epidemiology, and End Results (SEER) database. The experimental results revealed that the developed machine obtains considerable accuracy while it ignores difficult features for most .of the input samples

کلمات کلیدی:

breast cancer survivability prediction, Ensemble learning, multi-stage machines, Feature Selection