

## Classification of Potential Biomarkers in Breast Cancer Using Artificial Intelligence Algorithms and Anthropometric Datasets

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**Abstract :** Breast cancer (BC) continues to be the most frequent cancer in females and causes the highest number of cancer-related deaths in women worldwide. Inspired by recent advances in studying the relationship between different patient attributes and features and the disease, in this paper, we have tried to investigate the different classification methods for better diagnosis of BC in the early stages. In this regard, datasets from the University Hospital Centre of Coimbra were chosen, and different machine learning (ML)-based and neural network (NN) classifiers have been studied. For this purpose, we have selected favorable features among the nine provided attributes from the clinical dataset by using a random forest algorithm. This dataset consists of both healthy controls and BC patients, and it was noted that glucose, BMI, resistin, and age have the most importance, respectively. Moreover, we have analyzed these features with various ML-based classifier methods, including Decision Tree (DT), K-Nearest Neighbors (KNN), eXtreme Gradient Boosting (XGBoost), Logistic Regression (LR), Naive Bayes (NB), and Support Vector Machine (SVM) along with NN-based Multi-Layer Perceptron (MLP) classifier. The results revealed that among different techniques, the SVM and MLP classifiers have the most accuracy, with amounts of 96% and 92%, respectively. These results divulged that the adopted procedure could be used effectively for the classification of cancer cells, and also it encourages further experimental investigations with more collected data for other types of cancers.

**Keywords :** breast cancer, diagnosis, machine learning, biomarker classification, neural network

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