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HYBRID FEATURE SELECTION AND MACHINE LEARNING-BASED COMPARATIVE ANALYSIS FOR CERVICAL CANCER PREDICTION

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Cervical cancer is one of the major causes of cancer related death in female population in developing countries especially in Africa especially in the West African countries. The potential for early prediction and diagnosis is key to a better patient survival and treatment outcomes. This study aimed to develop a machine learning based cervical cancer prediction model based on a hybrid feature selection approach. Data pre-processing techniques like Missing Value Imputation, Normalization, class balancing with SMOTE were applied to the Cervical Cancer (Risk Factors) dataset. Hybrid feature selection technique (Select K Best + Mutual Information + RFECV) was used to determine the most important predictive features. Various classifiers such as logistic regression, SVM, decision tree, random forest, naive bayes and KNN were tested and compared based on the five parameters: accuracy, precision, recall, F1-Score, ROC-AUC with 5-Fold Cross Validation. The experimental results revealed that Random Forest gave best accuracy of 97.82%. The proposed framework successfully reduced the number of features and enhanced the predictive performance and was also tested on a prostate cancer dataset.