

INTISARI

Penelitian ini mengevaluasi dan membandingkan performa algoritma K-Nearest Neighbors (KNN) dan Artificial Neural Networks (ANN) dalam mengklasifikasikan kanker payudara berdasarkan dataset Breast Cancer, dengan fokus pada penggunaan seleksi fitur menggunakan metode Recursive Feature Elimination (RFE). Tujuan utama penelitian ini adalah untuk menentukan akurasi, presisi, recall, dan F1 Score dari masing-masing algoritma, baik dengan maupun tanpa seleksi fitur, serta mengidentifikasi kelebihan dan kelemahan masing-masing pendekatan. Hasil penelitian menunjukkan bahwa penggunaan RFE secara signifikan meningkatkan performa kedua algoritma. ANN dengan RFE mencapai akurasi tertinggi sebesar 98,64%, dengan presisi 99,31%, recall 97,03%, dan F1 Score 98,13%, menunjukkan superioritas ANN dalam klasifikasi kanker payudara. Sebaliknya, KNN dengan RFE juga menunjukkan peningkatan performa dengan akurasi 97,56%, presisi 97,32%, recall 96,29%, dan F1 Score 96,71%. Tanpa seleksi fitur, performa kedua algoritma menurun secara signifikan, dengan ANN mencapai akurasi 92,24% dan KNN hanya 89,03%. Hasil ini menegaskan pentingnya seleksi fitur dalam meningkatkan akurasi dan stabilitas model, serta menunjukkan bahwa ANN lebih unggul dalam menangani data yang kompleks dibandingkan KNN. Berdasarkan temuan ini, ANN dengan seleksi fitur RFE direkomendasikan sebagai model yang lebih efektif untuk klasifikasi kanker payudara.

Kata Kunci: K-Nearest Neighbors (KNN), Artificial Neural Networks (ANN), Klasifikasi Kanker Payudara, Dataset Breast Cancer, Seleksi Fitur, Recursive Feature Elimination (RFE), Akurasi, Presisi, Recall, F1 Score.

ABSTRACT

A COMPARISON OF BREAST CANCER CLASSIFICATION USING K-NEAREST NEIGHBORS AND ARTIFICIAL NEURAL NETWORK APPROACHES

By:

Benny Nurdianto

This study evaluates and compares the performance of K-Nearest Neighbors (KNN) and Artificial Neural Networks (ANN) algorithms in classifying breast cancer based on the Breast Cancer dataset, focusing on the use of feature selection using the Recursive Feature Elimination (RFE) method. The main objective of this research is to determine the accuracy, precision, recall, and F1 Score of each algorithm, both with and without feature selection, and identify the advantages and disadvantages of each approach. The results showed that the use of RFE significantly improved the performance of both algorithms. ANN with RFE achieved the highest accuracy of 98.64%, with precision of 99.31%, recall of 97.03%, and F1 Score of 98.13%, showing the superiority of ANN in breast cancer classification. In contrast, KNN with RFE also showed improved performance with 97.56% accuracy, 97.32% precision, 96.29% recall, and 96.71% F1 Score. Without feature selection, the performance of both algorithms decreased significantly, with ANN achieving 92.24% accuracy and KNN only 89.03%. These results confirm the importance of feature selection in improving model accuracy and stability, and show that ANN is superior in handling complex data compared to KNN. Based on these findings, ANN with RFE feature selection is recommended as a more effective model for breast cancer classification.

Keywords: K-Nearest Neighbors (KNN), Artificial Neural Networks (ANN), Breast Cancer Classification, Breast Cancer Dataset, Feature Selection, Recursive Feature Elimination (RFE), Accuracy, Precision, Recall, F1 Score.