
ENHANCEMENT OF PARAMETERS OF THE ARTIFICIAL NEURAL NETWORKS WITH ARITHMETIC OPTIMIZATION ALGORITHM FOR HEART FAILURE PREDICTION

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ABSTRACT

Heart failure is a serious illness that requires precise forecasting and prompt care [1]. This research investigates the application of Artificial Neural Networks (ANNs) for the early detection of heart failure, with a focus on optimizing ANN parameters using the Arithmetic Optimization Algorithm (AOA) [2]. Traditional artificial neural network models often face issues with local minima and demand substantial training time due to suboptimal parameter selections [3]. This study employs the AOA, a recently introduced population-based metaheuristic, to optimize the weight and bias parameters of the ANN, improving convergence speed and overall prediction accuracy with a dataset obtained from the Kaggle machine learning repository. Patient data, including vital signs and historical medical records, is used to train the model. The performance of the proposed algorithm proves the effectiveness of integrating the AOA with ANN for predicting heart failure diseases in patients.

Keywords Machine Learning · Artificial Neural Network · Arithmetic Optimization Algorithm · Heart Failure Prediction

References

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