

A Study on Different SVM Kernels with Suitable Pre-Processing Technique and Parameter Optimization for Cardiovascular Disease Prediction.

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Abstract

Early detection and analysis of cardiovascular diseases are essential as most of the population is already suffering. Machine learning allows automated analysis of heart diseases while suitable pre-processing techniques enhance the suitability of the data to classification algorithms. This research applied the SVM model to the clean and pre-processed UCI machine learning repository data. A comparison was made between the SVM model's classification performance before and after hyperparameter optimization. Optimal parameters were obtained using cross-validation by the grid search algorithm. Outlier detection and minmax scaler were used to pre-process the cleaned data. In contrast, the four kernel functions of SVM, namely linear, polynomial, radial basis function, and sigmoid were used to classify between having or not having cardiovascular disease. It was observed that the SVM algorithm built on a sigmoid kernel operating on min-max pre-processed data gave the highest accuracy of 85% amongst the simulation results and also that found in the existing literature.

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