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A hybrid wrapper approach for optimal feature selection based on a novel multiobjective technique

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Abstract

Recent technological improvements have caused data management challenges. In machine learning and data mining, preprocessing removes noisy, irrelevant, and redundant input. Feature selection is a pre-processing method that increases classifier performance. Researchers have employed single-objective optimisation to improve categorisation. Single-objective optimisation reduces accuracy. In this study, a hybrid wrapper approach feature selection employing recursive feature elimination (RFE) and extreme learning classifier (HWFS-RTE) algorithm is used to anticipate sickness. A multiobjective technique of improved teaching learning-based optimisation (iTLBO) is combined with the RFE method choose categorisation features. iTLBO also performs disease classification with the extreme learning machine (ELM) by tuning ELM's parameters using iTLBO. TLBO is a population-based optimisation strategy, as it requires more rounds to obtain the classification's fitness value. It combines extreme machine learning (ELM) to improve convergence speed and reduce computing complexity. In disease prediction, the hybrid model (HWFS-RTE) applied to the Breast cancer dataset from the UCI repository has a 98.4% accuracy rate.

Keywords

machine learning, feature selection, RFE, recursive feature elimination, teaching learning-based optimisation, feature extraction, health record, data mining, pre-processing, dimensionality reduction, accuracy, F measure

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