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Paper Title: Identification of Crucial Factors in Sleep Quality Using Machine Learning Models and MRMR Feature Selection Technique

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Abstract

Sleep health and lifestyle (SHL) exert a substantial influence on the quality of life of an increasing number of patients worldwide. This study used a public dataset of 374 individuals, with 12 predictors contributing to the classification of sleep disorders. We compared the feature selection techniques including Maximum Relevance-Minimum Redundancy (MRMR), Chi-square (χ^2), ANOVA, and Kruskal-Wallis. The best technique is MRMR feature selection. The data was curated to ensure unbiasedness and accuracy before applying MRMR feature selection and machine learning models to identify important factors in classifying the three main types of sleep disorders. 21 different machine learning models were trained, validated, and the classification accuracy was compared. The model that is the most adequate is the Bagged Trees, which has the highest cross-validation classification accuracy at 91.90%. This model requires only three predictors: Systolic Blood Pressure, BMI, and Physical Activity Level.
