19.MACHINE LEARNING-BASED CLASSIFICATION OF SLEEP DISORDERS: A PREDICTIVE ANALYTICS APPROACH

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Sleep disorders affect millions worldwide, leading to severe health complications if left undiagnosed. Traditional diagnostic methods, such as polysomnography, are time-consuming and costly. This study explores the application of machine learning algorithms for the classification of sleep disorders, aiming to improve accuracy and efficiency in diagnosis. Various supervised learning techniques, including Decision Trees, Support Vector Machines, Random Forest, and Deep Learning models, are utilized to analyze physiological signals such as electroencephalograms (EEG), heart rate, and respiratory patterns. Feature extraction and selection methods play a crucial role in enhancing model performance. The results demonstrate that machine learning significantly improves classification accuracy compared to conventional approaches. This research highlights the potential of artificial intelligence in revolutionizing sleep disorder diagnosis, enabling early intervention and personalized treatment.

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