

# Ensemble Learning Approach to Human Stress Detection Based on Behaviours During the Sleep

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## Abstract

Stress is an emotional or mental state caused by inescapable or demanding situations, known as stressors. Because of the high stress level humans are addicted to some illegal or unethical activities and also they try to do different activities to reduce their stress level. Because of that, the detection of human stress levels becomes important today. The major goal of this study is to look into how human stress detection is based on the behaviors during sleep using the ensemble learning algorithm. In the first experiment, five Machine Learning (ML) algorithms were used in the classification level, including Random Forest, Support Vector Machine (SVM), Decision Tree (J48), Logistic regression, and Nave Bayes. In a second experiment, an ensemble learning algorithm was used with an average probability combination method for the above five algorithms. Based on the experiment results, ensemble learning can classify the data with 94.25% highest accuracy, high precision, recall, f-measure values, and the lowest error rate in Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE) better than the separate algorithm results.

## Keywords

Machine Learning, Sleeping Habits, Stress Detection