

# SLEEP DISORDER ANALYSIS

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# 01 PROJECT GOALS



01

Develop an AI model to classify sleep patterns into 3 categories: Insomnia, Sleep Apnea, or Normal Sleep

02

Provide a seamless web-based platform for users to upload sleep data and receive instant results.

03

Assist individuals in early detection of sleep disorders, enabling timely medical consultation.

## 02. METHODS

01

Performed Principal Component Analysis (PCA) for feature selection and dimensionality reduction.

Applied Min-Max normalization to standardize data for optimal model performance.

02

Trained multiple machine learning models: Linear Regression, Logistic Regression, Support Vector Classifier (SVC), Random Forest, XGBoost, and Neural Networks.

Neural Network outperformed other models in accuracy and generalization.

03

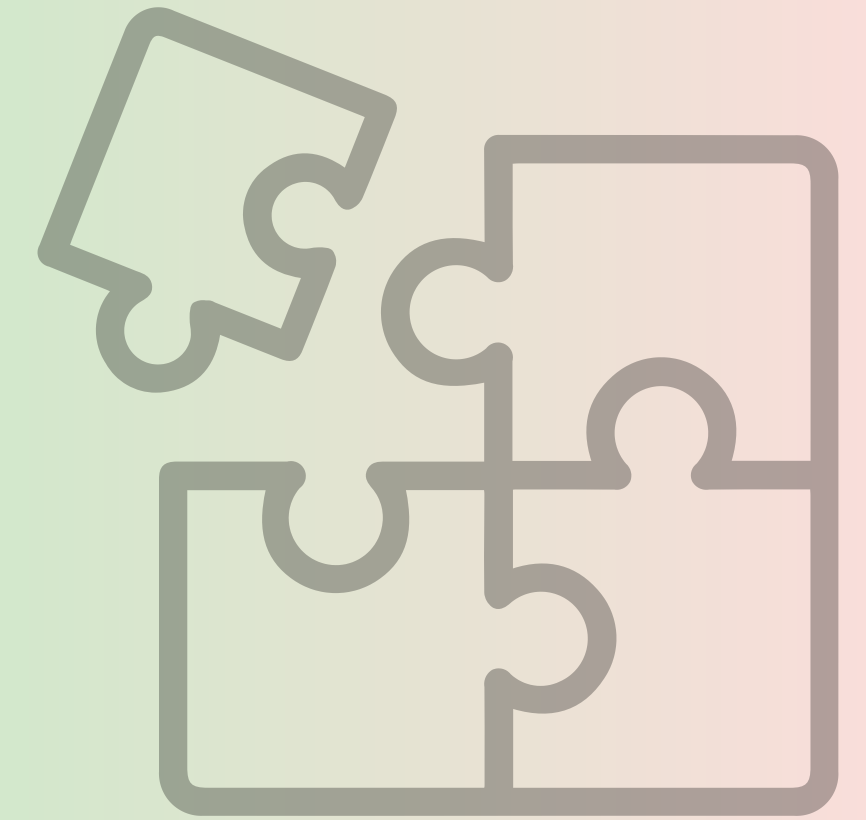
Evaluated models using ROC-AUC curves, Confusion Matrix, Accuracy, Precision, and Recall to ensure reliable predictions.

# ✦ 03. RESULTS

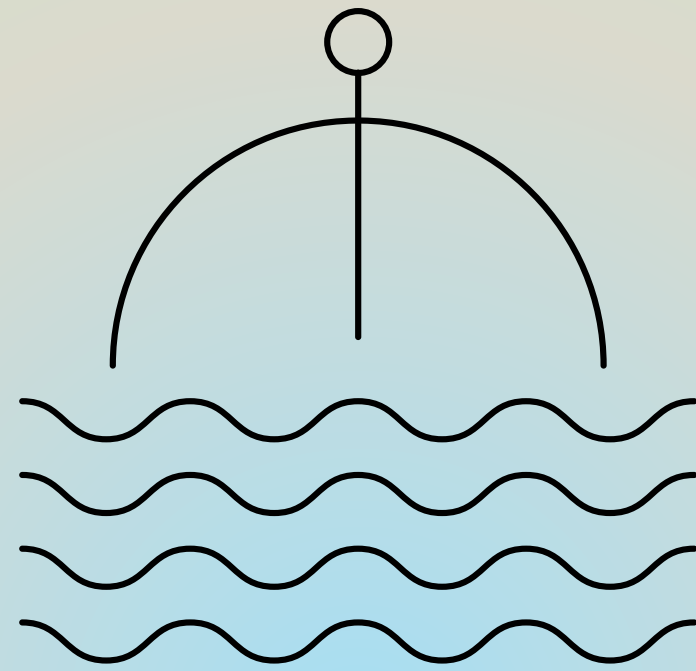
The model's excellent classification performance is reflected in the validation ROC AUC score. From a starting value of 0.7284 at the first epoch, the validation area under the curve (val\_auc) rose sharply to a value of 0.9026 at the third epoch and over 0.99 at the twenty-third epoch. It then plateaued at almost perfect values of about 0.999 at subsequent epochs, reflecting excellent class separation. Validation accuracy also rose considerably, to a value of 0.9867, while validation loss decreased steadily, reflecting good generalization and convergence. These reflect the model's high performance in reducing false positives and negatives and thus its high discriminative power.



## 04 | CONCLUSION ✨



Our model correctly classifies Insomnia, Sleep Apnea, and Normal sleep with ROC-AUC of 0.999 and validation accuracy of 98.67%. Neural Networks performed better compared to other models with good generalization and very few false predictions. With an easy web-based interface, the model provides an accurate and handy method of early sleep disorder detection, opening up avenues for improved sleep health awareness and diagnostics.



THANK YOU

