**EXISTING SYSTEM**

Proposed a model of early assessment of depression using machine learning model. They used stacked SVM model and achieved an accuracy of 89.4%. Milena Cukic et al.[11] used EEG and HFD signals as features for seven ML algorithms including Naive Bayes classifier, Logistic Regression, Random Forest, Decision Tree, Support Vector Machines and Multilayer Perception, with the linear and polynomial kernel. Average accuracy of the classifiers varies from 90.24% to 97.56%

Depression classification model using eye-movement data and ELM and also used Particle Swarm optimization for optimizing the parameters. The accuracy, sensitivity and specificity of the model using improved chaotic projection model and Gauss mutation strategy are 88.55%, 87.71% and 89.42%, respectively.

**LIMITATIONS**

**High Accuracy Across Methods:** The stacked SVM model achieved a notable accuracy of 89.4%, demonstrating its effectiveness in identifying depression in early stages. Other classifiers utilizing EEG and HFD signals achieved accuracies ranging from 90.24% to 97.56%, indicating strong predictive capabilities across multiple machine learning algorithms.

**Diverse Features for Robust Analysis**: Utilizing EEG and HFD signals as features provides a deeper understanding of neural patterns related to depression. Eye-movement data introduces another dimension to classification, capturing behavioral nuances that could indicate depression.

**Optimization Techniques for Enhanced Performance**: Particle Swarm Optimization (PSO) and improved chaotic projection models with Gauss mutation strategies have been employed to fine-tune parameters, leading to better accuracy (88.55%), sensitivity (87.71%), and specificity (89.42%). Optimization ensures the model is not only accurate but also reliable and generalizable

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**Comprehensive Evaluation Metrics**: Models have been evaluated on multiple metrics such as sensitivity and specificity, in addition to accuracy. This ensures a balanced performance, crucial for medical applications where false positives and negatives can have significant implications.

**Multiple Algorithm Comparison**: Comparing seven machine learning algorithms, including Naive Bayes, Logistic Regression, Random Forest, Decision Tree, and Multilayer Perceptron, with different kernels (linear and polynomial) provides insights into which models work best for specific data types.