**[1]. A Robust Heart Disease Prediction System Using Hybrid Deep Neural Networks:**

* The primary aim of this study is to develop a robust Heart Disease Prediction model utilizing Hybrid Deep Neural Networks. The approach involves employing algorithms such as Artificial Neural Networks (ANN), Conventional Neural Networks (CNN), and Long Short-Term Memory (LSTM).
* Additionally, the study proposes a Hybrid Deep Neural Network model that integrates CNN and LSTM architectures along with additional Dense layers to enhance the predictive performance of the model.
* The evaluation of the proposed models is conducted on two publicly available disease datasets: the Cleveland HD dataset and a comprehensive dataset comprising data from multiple sources (Switzerland, Cleveland, Statlog, Hungarian, Long Beach VA).
* The first dataset consists of two classes, 13 attributes, and 302 instances, while the second dataset combines information from five different Heart Disease datasets, comprising 11 features, 1190 instances, and two classes. Key features in the datasets include ST Slope, chest pain type, maximum heart rate, cholesterol levels, exercise-induced angina, old peak, age, resting blood pressure, gender, resting Electrocardiogram results, and fasting blood sugar levels.
* The performance of the proposed system is evaluated using various comparison metrics, including Matthews Correlation Coefficient (MCC), F1-measure, accuracy, precision, Area Under the Curve (AUC), and specificity.
* Following feature selection, the models are constructed using four Deep Learning prediction and categorization techniques: ANN, LSTM, CNN, and Hybrid CNN-LSTM. The results indicate that ANN achieves an accuracy of 94.53%, LSTM achieves 96.64%, CNN achieves 96.86%, and Hybrid CNN-LSTM achieves the highest accuracy of 98.86%.

**[2]. Effective Feature Engineering Technique for Heart Disease Prediction with Machine Learning:**

* The study introduces a novel feature engineering approach called Principal Component Heart Failure (PCHF), aimed at selecting the most significant features for improved performance.
* Using the PCHF technique, the study optimizes feature selection by creating a new feature set based on the most crucial features.
* The heart failure dataset sourced from Kaggle comprises 1025 patient records and 14 features related to heart failure.
* Nine advanced machine learning algorithms, including LR, DT, RF, SVM, KNN, MLP, NB, XGB, and GB, are compared for heart failure prediction. Performance metrics such as computation time, accuracy, precision, recall, and F1 score are used for comparison.
* Hyperparameter tuning is conducted to identify the best-fit parameters for each algorithm. The dataset is refined based on the eight best-fit features, determined through heat map analysis. Model performance is evaluated using k-fold cross-validation techniques.
* The decision tree method, coupled with the PCHF feature engineering technique, surpasses other models by achieving a remarkable accuracy score of 100%, indicating its efficacy in heart failure detection.