

Heart Failure Prediction System

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Abstract: Heart failure is a critical condition affecting millions globally, with early diagnosis playing a vital role in improving patient outcomes. This project aims to develop a machine learning-based Heart Failure Prediction System that leverages patient clinical data to predict the likelihood of heart failure, thereby assisting healthcare professionals in making informed decisions. The system uses historical data, including vital health metrics like serum creatinine, ejection fraction, and demographic information, to train various machine learning models. Algorithms such as Random Forest, Support Vector Machines (SVM), and Gradient Boosting Machines (GBM) are employed to achieve high accuracy in predictions. The project also incorporates data preprocessing techniques to handle missing values and feature selection to improve model performance. Additionally, the system provides a user-friendly web interface where healthcare providers can input patient data and receive real-time predictions. By using machine learning techniques, this system can facilitate early intervention, reduce hospital readmissions, and improve overall patient management in heart failure cases. However, challenges such as data privacy, model interpretability, and biases in clinical data remain areas for further research and refinement.

Keywords: Heart failure