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A Data-Driven Approach to Heart Stroke Prediction Using Machine Learning and Fuzzy Logic

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Early detection of heart strokes is crucial for timely medical intervention and improved patient outcomes. This research aims to develop a reliable and accurate heart attack prediction model using machine learning techniques on patient medical data. This study has conducted exploratory data analysis (EDA) on a Kaggle dataset, including variables such as age, sex, blood pressure, BMI, cholesterol, and smoking status. After preprocessing and cleaning the data, it was evaluated several predictive models, including decision trees, logistic regression, and artificial neural networks. Preliminary results indicate that systolic and diastolic blood pressure significantly impact stroke risk. To enhance the model accuracy and robustness, future work may integrate genetic fuzzy logic into the prediction model. This study contributes to the computing and medical domains by providing a framework for effective prediction and insights into key factors influencing heart attack risk, potentially aiding early diagnosis and personalized treatment plans.

Keywords: *heart stroke prediction, machine learning, exploratory data analysis, genetic fuzzy Logic, medical informatics*