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Paper Title: Early Prediction of Chronic Kidney Disease using AI

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Abstract

Chronic Kidney Disease (CKD) is a debilitating condition characterized by kidney damage, resulting in the accumulation of waste materials and eventually leading to renal failure. This disease has a profound negative impact on the quality of life of affected individuals and significantly increases mortality rates. Diagnosis of CKD typically involves a combination of blood tests, urine analysis, imaging studies, and occasionally, kidney biopsies. Using AI to detect chronic kidney disease instead of relying on traditional analysis methods allows for the identification of high-risk individuals, earlier diagnoses, and increased accuracy. This research paper delves into the application of a Python-based machine learning model for predicting Chronic Kidney Disease. The dataset employed in this study was carefully curated by hospitals in Tamilnadu, India, and encompasses a wide range of biomarkers obtained from urinalysis and blood tests specifically designed for detecting CKD. The primary outcome of this study is a model that predicts whether a patient has Chronic Kidney Disease. The CatBoostClassifier had a 100% accuracy in predicting Chronic Kidney Disease on the dataset used. Overall, this research highlights the potential of AI and machine learning in revolutionizing the field of CKD diagnosis. By leveraging advanced computational techniques, healthcare professionals can enhance their ability to identify and manage this chronic condition, ultimately leading to improved patient outcomes and better overall healthcare provision.
