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A systematic assessment and meta-analysis of machine learning methods for predicting and Classifying severe Long Term kidney disease

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Abstract



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Abstract:

Heart failure (HF), atherosclerotic cardiovascular disease, and end-stage kidney disease are all signs of long term kidney disease brought on by type II diabetes (CKD). However, because it has no symptoms, CKD is frequently overlooked or misdiagnosed. Without kidneys, a human beings can able live for about 18 days, necessitating dialysis and a kidney transplant. It is complex to have accurate tools for early diagnosis of kidney diseases. Additionally, patients frequently forego the common urine protein-based CKD detection test. It describes a medical condition that damages the kidneys and has an impact on the body as a whole. Inadequate diagnosis and care can lead to end-stage renal disease, which eventually kills the patient. In response to the shortcomings of conventional biomarkers and the requirement for early therapeutic intervention in cats with CKD to improve outcomes, new renal biomarkers for the detection of glomerular or tubular dysfunction have been discovered and validated. Changes in the concentrations of these biomarkers in the blood or urine may reveal early kidney damage or forecast the development of kidney disease before changes in conventional biomarkers can be seen. On Utilization of machine learning (ML) approaches, CKD prediction is simple. The method of the present study for predicting long term kidney disease and classifying it on basis of the clinical diagnosis information includes data preprocessing, a method for handling missing data, feature reduction and feature extraction. We examine some recent works on ML-based CKD detection and classification in this systematic review. It analyze of the step of data processing from data collection to data classification on utilizing the dataset preprocessing step, hybrid or ensemble feature extraction technique, meta-heuristics based feature selection

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technique and finally detection and classification of the kidney disease. To be more precise, we group this systematic review into two important types:...

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 Contents

I. Introduction

Kidney diseases are conditions that impair the kidney's ability to function. In the later stages of the disease, kidney failure can result. Haemodialysis is provided to 10,203 patients with kidney disease, according to data recently released by the Saudi Centre for Organ Transplant Registry [1]. Chronic kidney disease (CKD) is the primary illness in the world for kidney damage that lasts a lifetime. The glomerular filtration rate (GFR) is a well-known kidney disease diagnosis method that evaluates kidney processing in relation to the glomerulus, which is the nephron's blood-filtering component [2]. Long Term kidney disease is a disease where a person's kidneys are effected and difficult to filter their blood and to eliminate the metabolic waste. CKD typically progresses slowly over a long period of time. Over 800 million person around the world are estimated to be suffering by kidney disease, including long term kidney disease. In order to produce urine, the kidneys' main job is to eliminate excess water and bad contents from the blood. Waste has accumulated in the body of a person with Long Term kidney disease [3]. As a result of the harm occurring gradually over huge time period, sickness persists. A few of the many factors that cause kidney disease leads to heart disease, diabetes, and high blood pressure. Similar to these serious illnesses, chronic kidney disease (CKD) affects your kidneys and may also result in back pain, diarrhoea, fever, nosebleeds, a rash, and nausea. Diabetes and hypertension are two examples of the two primary infections that contribute to CKD. Therefore, managing these two conditions also means avoiding CKD. Typically, kidney damage is severe before CKD manifests [4].

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