Detection of Chronic Kidney Disease with Machine Learning

Part 1 : Selecting ten most important and relevant papers to your research topic and describing 1,2 lines summary of each paper.

Paper 1 : *Chronic kidney disease prediction using machine learning techniques*

Summary : The study used machine learning models (RF, SVM, DT) and feature selection methods (RFECV, UFS) to predict chronic kidney disease progression. Best accuracy: RF (99.8% binary, 82.56% five-class). Early prediction is crucial for patient care.

Paper 2 : *Chronic kidney disease prediction based on machine learning algorithms*

Summary : The study used various machine learning algorithms to diagnose Chronic Kidney Disease (CKD) at an earlier stage. After preprocessing the CKD dataset and performing PCA, hemoglobin, albumin, and specific gravity were identified as significant predictors. The accuracy of the algorithms was the main evaluation criterion for their performance.

Paper 3 : *Implementation of Machine Learning Models for the Prevention of Kidney Diseases (CKD) or Their Derivatives*

Summary : The study explores using a learning model to classify the possibility of a CKD diagnosis with an accuracy of 93%. The decision forests algorithm yielded optimal results. The methodology is tailored to the health system in Iraq and proposes a scalable solution using Microsoft Azure tools. The study's limitations include a small data sample, but future research could refine the model with more data and explore various interdisciplinary studies.

Paper 4 : *The Emerging Role of Implementing Machine Learning in Food Recommendation for Chronic Kidney Diseases Using Correlation Analysis*

Summary : The ML algorithm, including CNN, naive Bayes, and random forest, assists in diagnosing CKD with 88.85% accuracy. It analyzes glomerular filtration rate and detects changes in blood sugar, potassium, creatinine, and pus secretion. These ML algorithms

positively impact CKD detection, contributing to personalized nutrition plans and reduced mortality rates. However, further research is needed to detect secondary infections of persistent CKD, such as albuminuria and toxin generation.

Paper 5 : *A comparative assessment of artificial intelligence models used for early prediction and evaluation of chronic kidney disease*

Summary : Chronic Kidney Disease (CKD) is a challenging and fatal disease to diagnose accurately. Creating an application for detection can benefit both medical professionals and patients. Despite the complexity of CKD data, the system shows promising accuracy and resolves invariant problems. Neural networks offer untapped potential in machine learning, and this research highlights the role of lesser-known but effective libraries for creating highly accurate programs with minimal code.

Paper 6 : *Machine learning algorithms' accuracy in predicting kidney disease progression: a systematic review and meta-analysis*

Summary : ML algorithms have exceptional accuracy in predicting poor prognosis for kidney disease patients. They can help clinicians detect high-risk patients early, enabling timely treatment and management. Incorporating ML-based prediction models into clinical practice is recommended.

Paper 7 : *A survey of machine learning in kidney disease diagnosis*

Summary : The paper reviewed ML applications for kidney disease diagnosis (MLKDD) and proposed comprehensive frameworks for analysis. Ensemble methods showed better performance than routine MLs, and combining ML with the GFR test improved accuracy. Future research directions, including computer vision for kidney disease image segmentation, were discussed.

Paper 8 : *Predict, diagnose, and treat chronic kidney disease with machine learning: a systematic literature review*

Summary : This systematic review assesses how artificial intelligence (AI) and machine learning (ML) techniques have been used for predicting, diagnosing, and treating chronic kidney disease (CKD). English language studies from PubMed were included, following the Preferred Reporting Items for Systematic Reviews (PRISMA) approach. The review aimed to improve CKD diagnosis and patient management.

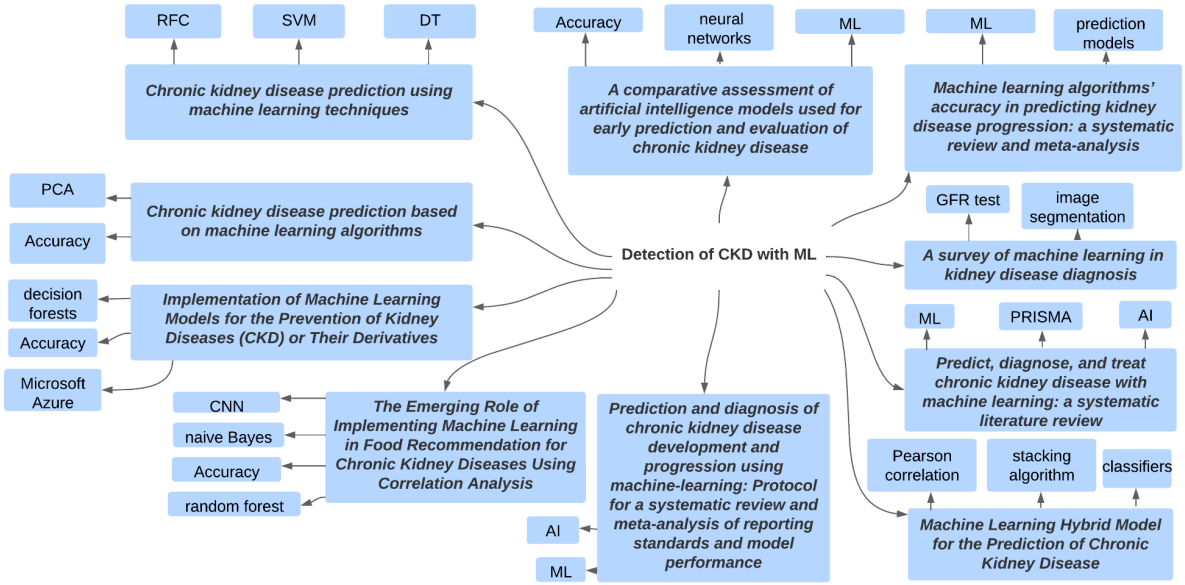
Paper 9 : *Prediction and diagnosis of chronic kidney disease development and progression using machine-learning: Protocol for a systematic review and meta-analysis of reporting standards and model performance*

Summary : AI and machine learning show promise in CKD care for early prediction and diagnosis. This review assesses model development rigor and compares ML-based algorithms' performance to guide future implementation in healthcare.

Paper 10 : *Machine Learning Hybrid Model for the Prediction of Chronic Kidney Disease*

Summary : Chronic kidney disease (CKD) is a life-threatening condition, often linked to lack of physical exercise. This paper explores machine learning as a diagnostic approach, showing its higher accuracy compared to other methods. The study uses the Pearson correlation feature selection and stacking algorithm with classifiers (GB, GNB, decision tree, random forest) to predict CKD with 100% accuracy on a dataset from the UCI directory. The proposed model can be applied to other diseases for improved accuracy.

Part 2 : Create a visualization of how each paper is related to each other.



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