



CHRONIC KIDNEY DISEASE AI PREDICTION SYSTEM

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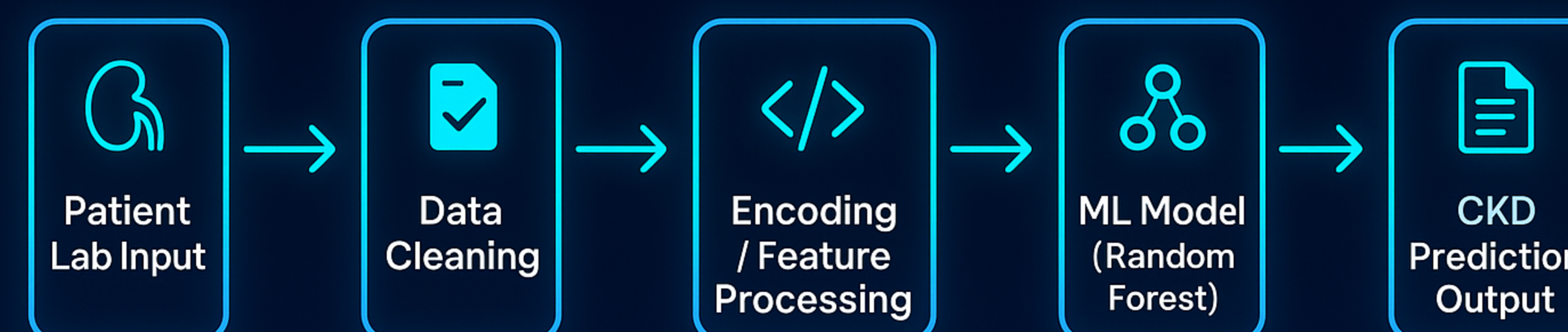
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Problem:

Chronic Kidney Disease (CKD) is difficult to diagnose early because symptoms appear late. Doctors often lack quick tools to interpret lab results and estimate disease risk. Without early prediction, CKD frequently progresses unnoticed.

Motivation:

The goal is to build an AI system that assists medical professionals by analyzing patient lab values, identifying risk factors, and generating early CKD predictions. The system can support diagnosis and expand into broader clinical decision-making in the future.



System Architecture:

The system processes patient lab data through cleaning and encoding, then passes it into a Random Forest model for CKD prediction. The model outputs a risk score with explanations for contributing factors, providing interpretable, reliable decision support.

Conclusion:

Our AI-based decision support system improves early CKD detection, increases clinician insight, and enables faster diagnosis. With modular design and Streamlit integration, the system is ready for expansion into broader medical prediction workflows.

Implementation Highlights:

A Random Forest model was developed to predict chronic kidney disease risk. The dataset was cleaned, processed, and key features were selected to improve performance. The model was trained on 400 patient records and achieved 96% accuracy, 94% precision, and 95% recall. Development was done using Python, Scikit-learn, and Streamlit.

Accuracy: 96% | Precision: 94% | Recall: 95% | F1 Score: 94%

Dataset size: 400 patients

Tools: Python, Scikit-learn, Streamlit

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