

Kidney Disease Classification

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Abstract: *Kidney diseases, such as tumors, cysts, and stones, are serious health conditions that affect millions globally. Medical imaging, particularly Computed-Tomography (CT) scans, plays an important role in diagnosing these conditions.*

Although, manual analysis of CT images by radiologist can be tiresome, fallible, and affected by human variability. This paper introduces a deep learning approach that employs Convolutional Neural Networks (CNN) for the automated classification of kidney CT scan images into four distinct categories : normal, cysts, tumors, and stones. The system is designed to boost diagnostic accuracy, reduce human error, and expedite clinical decision making. Through data preprocessing, CNN architecture design, training, and evaluation, the proposed model achieved a classification accuracy of 92%.

This study highlights the significance of CNNs in medical image analysis and their implicit for real-time deployment in clinical surroundings. Additionally, we compare our CNN-based approach with other advanced architectures like Vision Transformers, demonstrating CNNs' robustness and efficiency in this domain.

Keywords: Artificial Intelligence, Image Classification, Tensorflow, Deep Learning, VGG16 Model, CNN