

Chapter 10

AvD Ayur Vriksha

Diagnostics for Precise

Identification of

Medicinal Leaves in

Ayurveda Using Deep

Learning Techniques

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ABSTRACT

Medicinal plants have been used for hundreds of years in conventional medical systems due to their therapeutic properties. However, accurately identifying these plants

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remains challenging, particularly for individuals lacking expertise in botany. This study introduces an innovative method for the automated recognition of medicinal plants employing DenseNet, a highly layered neural network architecture commonly used for image categorization tasks. The method centered on gathering a wide array of portraits of various medicinal plants, together with their respective labels. To improve image quality and uniformity, preprocessing methods shall be used. Overall, the work presents a promising solution in terms of the automatic identification of medicinal plants and harnessing capabilities of DL methodologies. This approach can significantly aid botanists, herbalists, and healthcare practitioners in identifying and utilizing medicinal plants for various therapeutic purposes.

1. INTRODUCTION

The ancient Indian science of Ayurveda combines plant medicine with ancient medical knowledge. Many people are not able to identify these medicinal plants, which prevents them from taking advantage of the healing power of herbs. Recognizing Ayurvedic medicines requires an expert; however, regarding the type of plant, the expert may find himself in a dilemma. There are several enhancements in technology. DL and ML empower machines to perform tasks that are traditionally conducted by humans, albeit with greater efficiency and effortlessness. There exist several applications for machine learning that recognize humans, objects, trees, animals, etc. are available.

Nevertheless, there is a growing need for detection systems in the Ayurvedic field. due to a shortage of proficient experts, coupled with the increasing usage daily. DenseNet, an abbreviation for Densely Connected Convolutional Networks (DenseNet) is a neural network architecture categorized under CNNs. DenseNet is distinguished by its unique structure, which includes dense connections that link multiple layers. Diverging from conventional CNN architectures, DenseNet introduces a dense connectivity paradigm, wherein input from all previous layers is received by each layer, transmits, and maps all subsequent layers with its feature. This dense interconnection facilitates the reuse of features and soothes the flow of gradients throughout the network. Therefore, suggesting a system capable of identifying medicinal plants solely through a single image of the leaf. The gap between the Ayurvedic practitioner's knowledge and that of other people will be closed by this solution.

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