

# Identification of medicinal plants based on images using convolutional neural networks

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**Abstract:** This study presents a deep learning approach for the automatic identification of medicinal plant species based on leaf and flower images using Convolutional Neural Networks (CNNs). Given the critical role of medicinal plants in traditional and modern pharmacology, accurate species recognition is essential for quality control and safe usage. However, manual identification is often time-consuming and requires specialized botanical expertise. To address this, we developed and evaluated several CNN architectures, including VGG16, ResNet50, and a custom lightweight model, on a dataset comprising images of common medicinal plants. The models were trained using transfer learning and data augmentation techniques to enhance generalization and robustness against variations in lighting, background, and leaf orientation. Experimental results demonstrate that the proposed approach achieves a classification accuracy of over 95%, significantly outperforming traditional machine learning methods. The findings confirm that CNNs provide a reliable, efficient, and scalable solution for automated medicinal plant identification, with potential applications in mobile-based diagnostic tools and herbal medicine quality assurance.

**Keywords:** medicinal plants, image recognition, convolutional neural network, plant classification