

## Weed Classification Using a Two-Dimensional Deep Convolutional Neural Network

**Authors :** Muhammad Ali Sarwar, Muhammad Farooq, Nayab Hassan, Hammad Hassan

**Abstract :** Pakistan is highly recognized for its agriculture and is well known for producing substantial amounts of wheat, cotton, and sugarcane. However, some factors contribute to a decline in crop quality and a reduction in overall output. One of the main factors contributing to this decline is the presence of weed and its late detection. This process of detection is manual and demands a detailed inspection to be done by the farmer itself. But by the time detection of weed, the farmer will be able to save its cost and can increase the overall production. The focus of this research is to identify and classify the four main types of weeds (Small-Flowered Cranesbill, Chick Weed, Prickly Acacia, and Black-Grass) that are prevalent in our region's major crops. In this work, we implemented three different deep learning techniques: YOLO-v5, Inception-v3, and Deep CNN on the same Dataset, and have concluded that deep convolutions neural network performed better with an accuracy of 97.45% for such classification. In relative to the state of the art, our proposed approach yields 2% better results. We devised the architecture in an efficient way such that it can be used in real-time.

**Keywords :** deep convolution networks, Yolo, machine learning, agriculture

**Conference Title :** ICAEAAI 2023 : International Conference on Automation Engineering in Agriculture and Artificial Intelligence

**Conference Location :** Tokyo, Japan

**Conference Dates :** August 17-18, 2023