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| **Research paper** | **Abstract** | **Algorithm** | **Accuracy** |
| Cotton Disease Detection based on Deep Learning Techniques | These plant diseases are caused by insects or pests, which reduce the production on a large scale if not restricted promptly; cotton plant leaf diseases must be identified early and accurately, as they can harm yield. A deep learning model is trained with healthy and infected images is proposed in this paper. This model achieves its goal by classifying leaf images into different categories like healthy or diseased based on the infected patterns | other algorithms, such as U-Net and ResNet, have come into play. Convolutional Neural Networks have done well for simple images but not so well for detailed images | accuracy is achieved 97.13%, |
| Cotton Leaf Disease Detection and Classification Using Lightweight CNN Architecture | The main goal of this research is to classify 3 diseased class and one healthy class of cotton leaves using a deep learning-based lightweight CNN architecture. |  | "99.42% “, The suggested model beats the pre-trained transfer learning models VGG16 and VGG19 in terms of accuracy. These model’s classification accuracy was only about 96.80% & 95.92% respectively. |
| Cotton Pests and Diseases Detection based on Image Processing | Extract the damaged image form the cotton image to measure the damage ratio of the cotton leaf which caused by the diseases or pests. Several algorithms like image enhancement, image filtering which suit for cotton leaf processing were explored in this paper. Three different color models for extracting the damaged image from cotton leaf images were implemented, namely RGB color model, HSI color model, and YCbCr color model | RGB Color Model, HSI Color Model, YCbCr Color Model |  |
| Detection of cotton plant diseases using deep transfer learning | Cotton crops are affected when leaves fall off early or become afflicted with diseases. Farmers and planting experts, on the other hand, have faced numerousconcerns and ongoing agricultural obstacles for millennia, including much cotton disease. Because severe cotton disease can result in no grain harvest, a rapid, efficient, less expensive, and reliable approach for detecting cotton illnesses is widely wanted in the agricultural information area. Deep learning method is used to solve the issue because it will perform exceptionally well in image processing and classification problems. | The network was built using a combination of the benefits of both the ResNet pre-trained on ImageNet and the Xception component, and this technique outperforms other state-of the-art techniques | "95%”. The experimental results show that for ResNet-50, a training accuracy of 0.95 and validation accuracy of 0.98 is obtained whereas training loss of 0.33 and validation loss of 0.5. By employing a 152-layer ResNet on the Imagenet database, which is 8 times deeper than VGG-19 but it still has less foundation. On the ImageNet test set, a set of these ResNets caused an error of only 3.7 percent, which was the winning performance in the competition |
| Predicting the cotton leaf disease using convolution neural networks | The cotton plants are frequently affected by cotton splint disease. The common cotton leaf diseases are Cercosporin, microorganism scar, Ascochyta scar, and Target spot. Manual crop observation is a time-consuming process. This can be replaced by autonomous disease monitoring systems. This study intends to develop a cotton leaf disease detection model by utilizing Convolutional NeuralNetworks (CNN). The proposed model can identify cotton splint at an early stage and monitor the plant growth effectively | CNN is used to classify cotton leaf images. Then, a neural network is applied on the full image. | The final accuracy of training and testing is 80% and 89%. |
| Detection and classification of cotton leaf diseases using faster R-CNN on field condition images | Convolution neural networks have played a vital role in plant classification and identification of diseases, but still, work is needed to help farmers and pathologists correctly detect and classify diseases. manual checking of disease crops takes a lot of time and cost, and it is hectic. Besides, the wrong diagnosis entails inaccurate conclusions, treatment, and significant expense. | This paper proposes to train a deep learning faster R-CNN model on cotton crop leaf dataset (CCLDataset) for detecting and classifying diseases on leaves, including both healthy and diseases. Plant Village dataset is the reference in finding the best feature extractor from VGG-16, InceptionV1, and V2. Additionally, it is a base model in Faster R-CNN. Transfer learning is performed on CCLDataset when trained on the model Faster R-CNN inceptionV2 coco by replacing the output layers of coco with CCLDataset to detect and classify leaf diseases | The experimental results show a mean average precision (mAP) of 87.1% |
| Cotton leaf diseases recognition using deep learning and genetic algorithm | Approximately 1.5 million people in Pakistan are engaged in the cotton value chain. However, several diseases such as Mildew, Leaf Spot, and Soreshine affect cotton production. Manual diagnosis is not a good solution due to several factors such as high cost and unavailability of an expert. Therefore, it is essential to develop an automated technique that can accurately detect and recognize these diseases at their early stages. In this study, a new technique is proposed using deep learning architecture with serially fused features and the best feature selection | a pre-trained deep learning model named ResNet101 is employed and trained through a transfer learning approach, features are computed from the third and fourth last layers and serially combined into one matrix, a genetic algorithm is applied to the combined matrix to select the best points for further recognition, a Cubic SVM approach was utilized and validated on a prepared dataset. | On the newly prepared dataset, the highest achieved accuracy was 98.8% using Cubic SVM |
| Machine Vision based cotton recognition for cotton harvesting robot | A new cotton recognition method is proposed in this paper. It provides parameters for motion of the manipulator so that it can acquire precise location information of cotton, identify cotton from surroundings correctly, and accordingly pick up them automatically. This method is based on colour subtraction information of different parts of cotton. | Colour analysis for cotton, Image processing (colour subtraction module, dynamic freeman chain coding) | The accuracy of recognition reaches above 85% in the four experiments |