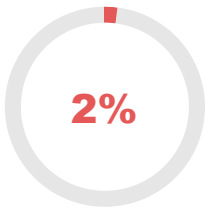
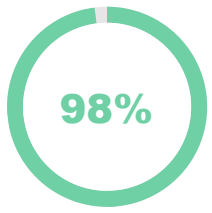
Plagiarism Scan Report

Report Generated on: Oct 16,2022



Plagiarised



Unique

Total Words:	**676**
Total Characters:	**4309**
Plagiarized Sentences:	**0.68**
Unique Sentences:	**33.32 (98%)**

Content Checked for Plagiarism

Crop Disease Detection

Dataset Description: We take into account the PlantVillage dataset while detecting plant leaf disease. The collection includes 87,000 RGB images of both healthy and ill crops, each with a range of 38 class labels. There are 14 crops mentioned, and there are a total of 26 illnesses. The dataset has been expanded to add more diversity, and the photos have been transformed into 256*256 pixels after being normalized by dividing them by 255. The training to validation ratio for the dataset is 75:25.

Approach:
We used the residual attention network to perform classification tasks. It has 11.3 million parameters. This model has two major advantages they are :

Residual connection : It is a gateless or open-gated variation of the HighwayNet, which was the first functionally complete, extremely deep feedforward neural network with hundreds of layers—much deeper than conventional CNN networks.
Attention network : Attention is a method that simulates cognitive attention in neural networks. The purpose of the impact is to encourage the network to give greater attention to the little but significant portions of the input data by enhancing some and reducing others.
2. Compiled the model with following parameters:
Optimizer : Adam (learning rate = 0.0001)
Metrics : Accuracy
Loss : Categorical cross entropy

3. Train the model with following parameters:
Batch size : 32
Epochs : 25
Callbacks : ModelCheckpoint, EarlyStopping, ReduceLROnPlateau

Fertilizer Recommendation

Dataset Description: We employ a proprietary dataset with 4 features—Crop, N, P, K, and pH—for fertilizer recommendation. There are 22 different crops with their perfect N, P, and K values, including rice, maize, coffee beans, mothbeans, soybeans, and coffee.
The farmer is advised to use fertilizer based on the pH range, N, P, or K value deficiency, and other factors.

Approach: We have used rule-based classification– To provide a plant the optimal fertilizer, a classification technique that uses fuzzy logic rules for class prediction. A fertilizer is advised based on how far a plant is from its ideal N, P, or K value. Based on whether the N/P/K values are high or low, we now recommend 6 different types of fertilizer.

With a small gap between the train and test sets, the residual attention model did not overfit the dataset. On the train-set and test-set, it achieved 98.6% and 98.2% accuracy, respectively. However, by fine-tuning the model's hyperparameter with an optimization technique, the model's performance can be improved up to 99.5%. The main benefit of this model is that it can also handle data that is not distributed, however it is computationally expensive and needs a GPU setup to be trained.

Conclusion and future work

In this study, we present the "Farmer's Assistant," a user-friendly web application system built on machine learning and deep learning. Our system successfully enables the provision of a number of features, including the recommendation of crops using Artificial Neural Networks and Voting Classifiers, the recommendation of fertilizers using a rule-based system, and the detection of crop diseases using Residual Attention model on leaf images. The user can input data using forms on our user interface and receive responses immediately.

Only 22 crops are supported by our crop recommendation system at the moment, but we want to be able to apply sophisticated machine learning systems in the future to make recommendations that are even more precise.

After examining the plant disease model, we discovered that model performance declines when we use data outside of the domain. As a result, the best course of action is to generalize the model by gathering additional data from various distributions, training the model, and then expanding the data set.

Last but not least, we also want to offer fine-grained segmentations of the dataset's diseased section. Currently, a lack of such data prevents this from being possible. However, we may incorporate a segmentation annotation tool inside our application so that users can point out any shortcomings. Additionally, we can identify the unhealthy regions in the image by using some unsupervised methods. In our forthcoming work, we plan to include these features and fill in these gaps.