Plant Seedling Classification

Yang Qiao, Haotian Cheng, Xueyao Liang

Project Introduction

Function:

- Classify up to 12 species of plant seedlings

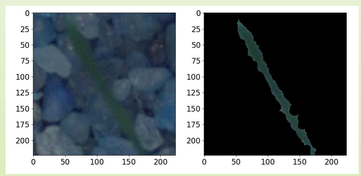
Major User :

- Farms get better yields by identifying plant seedlings
- Botanist study diversity of species
- Students learn to classify species

Method

Pre-processing

- Detect and segment the plants in the images.
- Preprocess images to shape (299,299,3) with values in the range [-1,1]



Extract Bottleneck Features

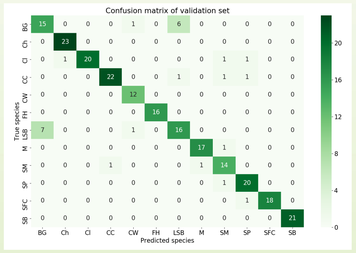
Build neural networks

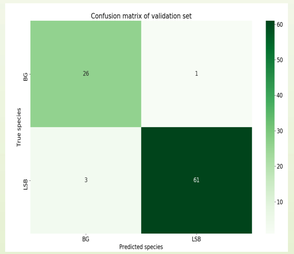
- Logistic regression
- Convolutional neural network with Tensorflow

Train and validate models

Results

Confusion Matrix
(show accuracy)



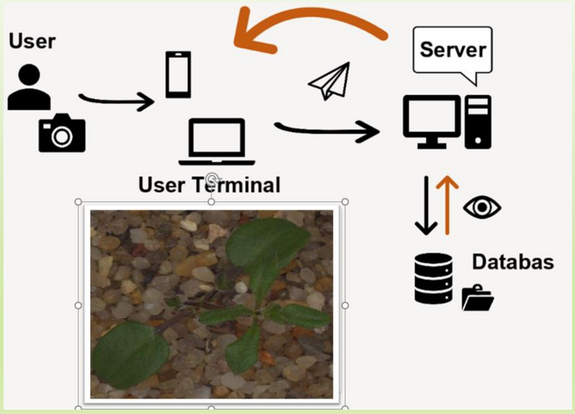


Training Loss and Accuracy

Validation Loss and Accuracy

- The accuracy for the 12-catergrories is 0.892 (but the accuracy for BG & LSB is 0.674)
- The accuracy for the 2-catergrories is 0.956
- By combining the two models together: The total accuracy is 0.943.

System Diagram



Website

Website Function

- Select a picture with single seedling
- Upload the file to get the feedback

Github Location: https://github.com/HaotianCheng/PlantSeedlingClassification-Group13