Kategoryzacja chorób jabłoni na podstawie wyglądu ich liści

Mateusz Garczyński Zuzanna Twardowska
Wiktor Wołek Dawid Wysocki Sonya Pobiedimska

Rysunek 1: Choroby widoczne na liściach jabłoni. Źródło: kaggle [1].

1 Progress

During the third sprint we have concentrated on creating our first ML models and setting up the environment for model training. Additionally, we have got acquainted with pretrained models.

2 Environment

While searching for an environment to test our models, we have tried using various services. Our first choice was Azure Machine Learning, however, the available free virtual disk space was only 15GB and our dataset was in excess of 16GB. After resizing and cropping the images, we still weren't able to upload the data because of the errors during the upload.

Therefore, we have tried using Google Colab. During platform setup, it failed to load images from Google Drive.

Finally, we have decided to train the models on our PCs. Training takes around 2-4 hours, even with low amount of trainable parameters, so it is still crucial that we continue the pursue to find a remote environment with enough processing power and data storage that will be cost-free for academic use.

3 Models

We have started our work by testing the simplest models in order to make sure our environments and workflow were working correctly. Gradually we were adding more layers and parameters.

We have decided to modify a pretrained model created to compete in ImageNet Large Scale Visual Recognition Challenge. The pretrained model, called Inception V3, was created by Google and was originally used to detect objects and their accurate location in images, as well as scene classification and object detection on video. In our case it was modified to classify 12 classes of leaf diseases.

As model's was reaching as high as 71% during training, we were quite optimistic. However, it failed to reach our expectations - evaluation showed only 16% of accuracy. It was still higher than random accuracy for this amount of classes $\frac{1}{12} \approx 0.0833$.

In order to improve the accuracy, we have added some extra layers to preprocess the input. It increased the amount of input data by changing the orientation, rotation and zoom level of the data we have extracted from the kaggle competition. After retraining model with just one epoch we got much higher accuracy: 0.5279 during training and 0.5989 on the evaluation.

4 Conclusion

The last trained model has assured as that we are going in the right direction. Our plan for the next sprint is to retrain that model with more epochs and see what else we can do to increase it's accuracy.

Literatura

[1] Platform kaggle.com: https://www.kaggle.com/c/plant-pathology-2021-fgvc8/

[2] https://cloud.google.com/tpu/docs/inception-v3-advanced