Date: April 3, 2020
To: Amir Hossein Jafari
From: Kang Huang, Xin Ma, Yongchao Qiao
Subject: Proposal for identifying the category of foliar diseases in apple trees

Purpose

The purpose of our project is to identify the category of foliar disease in apple trees. We train a network to recognize the disease of the leaves in the image. It is an image identification problem. It is a Kaggle competition. The link is https://www.kaggle.com/c/plant-pathology-2020-fgvc7/overview.

To have a deep understanding of the pytorch and CNN, we choose this problem as our project. And also, misdiagnosis of the many diseases impacting agricultural crops can lead to misuse of chemicals leading to the emergence of resistant pathogen strains, increased input costs, and more outbreaks with significant economic loss and environmental impacts. Now diagnosis based on the human scouting is time-consuming and expensive. So we choose this subject to help recognize the disease of the apple trees.

Dataset

The dataset is from a Kaggle competition. It includes 1821 train images and 1821 test images. There are four targets: healthy, multiple_diseases, rust and scab. And it is only one category for each image. It is large enough to train a neural network.

Method

We will build our own convolution neural network instead of using the pretrained network in this project. In the project, we use pytorch as our framework and may change the structure of the network to get a higher score. The reason why we use this framework is that all of us are familiar with pytorch and it is effective for this network and project. If we have some problems, we may search online, especially the notebook on this Kaggle competition. And also, pytorch tutorial is a perfect material that we can use. Here we use roc_auc_score as our metrics in the project. Because the submissions are evaluated on mean column-wise ROC AUC.

Schedule

4/4- 4/7	Data load and preprocess, Exploratory data analysis
4/8- 4/18	Build model and hyperparameter tuning
4/19 – 4/22	Prepare reports and presentation