

## Deep Learning Methods for The Plant Disease Detection Platform

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We have introduced the Plant Disease Detection Platform (PDDP) which allows users to send photos of sick plant leaves or textual descriptions of their appearance to obtain the information about an infection that hit the vegetation and treatment tips. The backend of the platform in terms of deep learning includes image classification model and text similarity model. The image classification model has two parts: feature extractor and classifier. The feature extractor is trained using the triplet loss along with transfer learning when the weights of the network are initialized from the MobileNetV2 pretrained on the ImageNet dataset. The classifier is a simple multilayer perceptron which test on 100 random plant images from the Internet shows 98% of the classification accuracy. We did the post-training static quantization in order to reduce the overall model size and increase inference performance. The final model has a size of 7 Mb and works 5 times faster than the initial model without significant loss of accuracy. The text similarity model is a BERT-based transformer for obtaining vector representation of input texts for further similarity calculation between user requests and disease descriptions on the PDDP.

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