Transfer Learning Cheatsheet

small dataset
similar images

1. Remove end of the NN
2. Add a FC layer that matches my # of classes.
3. Randomize weights of FC and Freeze the pre-trained weights.
4. train to update FC weights.

* why freeze the pretrained model ? avoiding overfitting.

small dataset
different images

1. Only keep some of the first few layers in the pretrained model.
2. add a fc network that matches my # of classes.
3. Randomize fc weights and freeze layers from pretrained one.
4. train to update weights of FC.

* why freeze the pretrained model ? avoiding overfitting

large dataset
similar images

1. Remove the last FC in the pretrained model.
2. Replace it with a layer that matches my # classes.
3. randomly init FC weights.
4. Use the pretrained model to initialize the rest of weights.
5. Retrain the whole thing.

large dataset
different images

1. Remove the last FC from the pretrained network.
2. Replace it with a new FC that matches your # classes.
3. Retrain the whole network from scratch with random init weights.

Alternatively, one can do the approach on the left.
Initializing weights with pretrained model may speed up training