1. NN

There are 346373 parameters in this model. The best training accuracy is 0.7629. The best validation accuracy is 0.7716. Because the training accuracy is not higher than the validation accuracy, there is no over fitting.

2. Simple CNN

There are 8069 parameters in this model. The best training accuracy is 0.8289. The best validation accuracy is 0.8244. It is better than NN because of higher accuracy and less parameters. Because the training accuracy is close to the validation accuracy, there is no over fitting.

3. Color Normalization

There are 8069 parameters in this model. The best training accuracy is 0.8838. The best validation accuracy is 0.8584. It is better than NN and CNN because it standardizes lighting and improves accuracy. Because the training accuracy is higher than the validation accuracy, there is some over fitting problems.

4. Deep CNN

There are 29077 parameters in this model. The best training accuracy is 0.8992. The best validation accuracy is 0.8708. It is better than previous models because it can extract more complex information. Because the training accuracy is higher than the validation accuracy, there is some over fitting problems.

5. Data Augmentation

There are 29077 parameters in this model. The best training accuracy is 0.8697. The best validation accuracy is 0.8740. It is better than previous models because it can synthetically generate more training data for training to avoid over fitting. Because the training accuracy is close to the validation accuracy, there is no over fitting.