Approach for CV Problem

In the given problem of image classification, I had tried three approaches – plain CNN, ResNet and inception model. In the inception model I figure out that computational cost has increased too much even for 3-4 layers, so I dropped the idea of this model. Then I tried ResNet and plain CNN approach and in that I figure out that ResNet is not so much effective in my case probably because limitation of no. of examples(tried Data augmentation but proved not that much effective on my PC) and mainly because ResNet proves to be effective in very deep network and used in complicated models generally and also require high computational cost(I have commented out the ResNet model in code file ) . So, after too much tuning I opt for plain CNN network for the problem and used TensorFlow (keras) frame work in the code. In the plain network I first started with two layers of convolution, each followed by a MaxPool layer and relu activation function and one more Conv layer followed by two dense layer and finally a SoftMax layer for output. After running this network, I encountered bias problem and variance problem. So, to solve this I increased two Conv layers followed by MaxPool and relu activation to train a little bit deep network to reduce bias problem. Also, for variance problem I used BatchNormalisation (so that each layer gets trained independently without much dependence on other layers so if model encounter difference in distribution of data it can handle that and little bit of regularization effect too) and L2 regularization effect in Conv layer as well as in Dense layer. Later, I added Dropout to the dense layer with 0.5 keeping probability of neurons in dense layers.

I opt for Adam optimizer for back propagation so that model could learn more general rather than specifically for training set. Apart from this I subdivided given training set into 70-30 ratio so that I could use later one as my dev set. After tuning I set image size to be 100x100,no. of epochs to be 35 and batch size to be 16 for optimize performance on my pc.