Convolutional Neural Network (CNN) has been described by most researchers as the best when it comes to image classification problems. This Neural Network is made up of high sensitive hyperparameters, such that if not properly design could lead to model misclassification and such returns high false positive (FP) and high false negative(FN). In other to solve this problem, this research proposed and developed design frameworks that mitigate this identified problem when it comes to image classification model using a Convolutional Neural Network.