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| **Exp No.** | **Neural Network Tech** | **No. of Trainable Parameters** | **Epochs** | **Accuracy** | **Remarks/Results** |
| 1 | CNN3D | 220,405 | 5 | Train: 0.84  Val: 0.54 | 1. This is was a very simple model, it was use to check whether everything is working as expected. 2. We were able to achieve good training accuracy but not very good validation accuracy. 3. Lets start with complicating the architecture that is adding more convolution layers and reducing the dimension of the images to (100,100) |
| 2 | CNN3D | 282,789 | 8 | Train:0.83  Val: 0.23 | 1. As we increased the number of convolution steps the validation accuracy decreased more drastically. 2. We will try to make our model very complex this time. |
| 3 | CNN3D | 920,517 | 8 | Train: 0.92  Val: 0.42 | 1. Still our training accuracy is good but our validation accuracy is very low, this is a case of overfitting. 2. Let’s make our model simple to reduce overfitting. 3. Reducing the size of the kernel in next step. |
| 4 | CNN3D | 810,677 | 8 | Train:0.93  Val:0.39 | 1. Still no effect on the Validation accuracy. 2. We can try Dropouts now to reduce overfitting. |
| 5 | CNN3D | 810,677 | 10 | Train: 0.39  Val: 0.16 | 1. With Dropouts both validation and training accuracy was very low. 2. So adding Dropouts didn’t work in our favor. 3. Let’s move to CNN2D with LSTM/GRU. |
| 6 | CNN2D+GRU | 999,621 | 12 | Train: 0.99  Val: 0.65 | 1. Adding GRU to the CNN2D doesn’t effect our results, the only difference we see here is the increase in overifitting. 2. We should move to data augmentation for better results. |
| 7 | CNN3D + Data Augmentation | 3,637,477 | 20 | Train: 0.82  Val: 0.80 | 1. After adding data augmentation, overfitting has been removed. 2. The training and validation accuracy is around 81 percent. 3. This model seems to be pretty good. 4. Next we try to achieve similar results with lesser parameters |
| 8 | CNN3D + Data Augmentation | 2,547,589 | 15 | Train: 0.85  Val: 0.70 | 1. On decreaseing the number of paramters we found that the validation accuracy has decreased. 2. Let’s use CNN2D + GRU with Data Augmentation |
| 10. | CNN2D+GRU + Data Augmentation | 11,131,077 | 12 | Train: 0.89  Val: 0.68 | 1. Not a very good accuracy was achieved using this architecture. 2. Training accuracy is still pretty good. 3. Let’s make our model simpler. |
| 11. | CNN2D+GRU + Data Augmentation | 2,606,085 | 22 | Train: 0.98  Val: 0.78 | 1. The validation accuracy is good , but training accuracy is extremely high. 2. We should try transfer learning, with pre trained weights |
| 12 | Transfer Learning+ LSTM+ pre-trained Weights | 2,707,205 | 10 | Train: 0.57  Val : 0.42 | 1. Using Pre trained weights of mobile net v2, the model accuracy was not good. 2. Lets train the complete Mobilenetv2 in next experiment. |
| 13 | Transfer Learning+ LSTM | 4,259,205 | 10 | Train: 0.80  Val: 0.73 | 1. Still the results are not good enough. 2. Lets try Mobilenetv1 |
| 14. | Transfer Learning+ LSTM+ mobilenetv1 | 4,259,205 | 15 | Train: 0.82  Val: 0.83 | 1. This model performs extremely well, but the size of the model is around 50MB which is huge as per our problem statement. 2. Now we will go for the earlier model(model 7) and try and tune it as it showed some promise. |
| 15. | CNN3D + Data Augmentation | 2,573,541 | 18 | Train:0.98  Val: 0.80 | 1. This model overfits. 2. Reducing the number of layers in the next experiment. |
| 16. | CNN3D+Augmentation | 8,454,789 | 18 | Train: 0.99  Val: 0.74 | 1. The validation accuracy is low and training accuracy is almost 100 percent. 2. The better way would be to retrain the model 7 with more number of epochs. |
| 17 | Retrain model 7 with more number of epoch | 3,637,477 | 30 | Train: 0.90  Val: 0.84 | 1. This is the best model achieved at 29th epoch. |
| **Final Conclusion:** The best model is 17 as it has balanced accuracy between train and validation of Train: 0.90 Val: 0.84.  The model is also very light so it can be used in our problem statement easily.  There is no high variance and high bias issue with the model. | | | | | |