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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| S.NO | Model Name | Batch\_size | Augmentation | No of Frames | Epochs | Resolution | No of parameters | Training Accuracy | Validation Accuracy | Remark |
| 1 | CONV-3D | 30 | Yes | 30 | 2 | 160\*160 | 1,736,389 | NA | NA | Getting an OOM error. |
| 2 | CONV-3D | 30 | Yes | 30 | 2 | 150\*150 | 1,425,093 | NA | NA | Getting an OOM error. |
| 3 | CONV-3D | 30 | Yes | 30 | 2 | 140\*140 | 1,146,565 | NA | NA | Getting an OOM error. |
| 4 | CONV-3D | 30 | Yes | 30 | 2 | 130\*130 | 1,736,389 | NA | NA | Getting an OOM error. |
| 5 | CONV-3D | 30 | Yes | 30 | 2 | 120\*120 | 900,805 | NA | NA | Getting an OOM error. |
| 6 | CONV-3D | 30 | Yes | 30 | 2 | 110\*110 | 6,87,813 | 56% | 50% | This resolution had fit into our memory.Now, we will experiment with the frames to sample and batch size to check our model performance. |
| 7 | CONV-3D | 30 | Yes | 20 | 2 | 110\*110 | 6,87,813 | 49% | 57% | Change in the number of frames to sample to 20 resulted in a decrease in the model performance |
| 8 | CONV-3D | 30 | Yes | 16 | 2 | 110\*110 | 6,87,813 | 52% | 60% | Change in the number of frames to sample to 16 resulted in an increase in the model performance. The effects of frames to sample seems to be a bit inconclusive.Also, there is no change in parameters of the model.However, we are going to accept that there is indeed some sort of correlation between both. |
| 9 | CONV-3D | 40 | Yes | 30 | 2 | 110\*110 | 6,87,813 | 36% | 37% | Now, increasing the batch size keeping the number of frames to sample and resolution fixed. The performance seems to have decreased. |
| 10 | CONV-3D | 50 | Yes | 30 | 2 | 110\*110 | 6,87,813 | 35% | 47% | Now, increasing the batch size to 50 keeping the number of frames to sample and resolution fixed. The performance seems to have deteriorated. |
| 11 | CONV-3D | 60 | Yes | 30 | 2 | 110\*110 | 6,87,813 | 38% | 34% | The performance doesn't seems to have improved. Hence, we can say via these experiments that increase in batch size has a negative effect on the performance. |
| 12 | CONV-3D | 20 | Yes | 25 | 25 | 120\*120 | 2,30,949 | 63% | 72% | There seems to be a lot of over-fitting. The inputs are not augmented. |
| 13 | CONV-3D | 20 | Yes | 25 | 2 | 120\*120 | 2,30,949 | 57% | 64% | There seems to be a lot of over-fitting. The inputs are augmented. |
| 14 | CONV-3D | 20 | Yes | 19 | 3 | 130\*130 | 11,46,565 | 58% | 78% | The over-fitting seems to have increased. The inputs are augmented. |
| 15 | CONV-3D | 30 | No | 25 | 3 | 100x100 | 11,81,493 | 49% | 31% | Adding more layers without augmentation. |
| 16 | CONV-3D | 30 | Yes | 25 | 3 | 100x100 | 11,81,493 | 52% | 69% | Model with augmentations seems to perform better performance eventhough the memory footprint remains the same |
| 17 | CONV-3D | 30 | Yes | 20 | 25 | 120x120 | 2,30,949 | 62% | 59% | Altering the previous architecture by using fewer number of filters. |
| 18 | CONV-3D | 50 | Yes | 20 | 25 | 120x120 | 2,30,949 | 71% | 68% | After, increasing the batch size to the mew model. The model accuracy when built over greater epochs increases. |
| 19 | CONV-3D | 20 | Yes | 25 | 25 | 120x120 | 2,30,949 | 71% | 63% | After, decreasing the batch size to the new model. The model accuracy when built over greater epochs increases. |
| 20 | CONV-3D | 20 | Yes | 25 | 35 | 160x160 | 4,39,845 | 82% | 83% | After increasing the resolution of our input and decreasing the batch size we come to our best model yet. This can be considered for deployment as it has a very small memory footprint and least number of parameter while not compromising. |
| 21 | CNN+LSTM | 20 | yes | 25 | 20 | 120x120 | 16,57,445 | 85% | 66% | This model seems to be over-fitting and it doesn't performs better in any category as compared to the model created before it. |
| 22 | Transfer learning with MobileNet (Weights frozen) | 20 | yes | 25 | 25 | 120\*120 | 35,16,229 | 93% | 60% | The transfer learning model with weights frozen seems to be overfitting by a lot based on the plots.This is not an acceptable final model. |
| 23 | Transfer learning with MobileNet (Training all weights) | 16 | yes | 16 | 5 | 120\*120 | 35,16,229 | 91% | 94% | This seems to be the best model in terms of performance but the number of parameters involved are quite a lot.We have already built a custom model with a decent performance and memory footprint which we feel is better suited for real time processing. |

**Model Number 20 is our Chosen Model**