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| --- | --- | --- | --- | --- | --- |
| **Experiment** | **Model** | **Cat Acc** | **Val Acc** | **Result** | **Decision + Explanation** |
| **1.** | **Conv3D** | **0.2500** | **0.2083** | **Validation loss was not improving** | **Started with 15 frames, model shows good improvement but with less accuracy.** |
| **2.** | **Conv3D** | **0.2750** | **0.1528** | **Model accuracy increases** | **Validation increases with increase in frames.** |
| **3.** | **Conv3D** | **0.2239** | **0.2100** | **Model tends to overfit with 10 epochs.** | **As no of parameter are high we decided to change the architecture and frames to 30.** |
| **4.** | **Conv3D** | **0.2090** | **0.2100** | **Not much improvement in accuracy with increase in layers.** | **Increase in no of layers didnt help much, no of parameters increase but didnt see increase in accuracy.** |
| **5.** | **Conv3d** | **0.3881** | **0.5400** | **Validation accuracy increases then train accuracy which shows weak training data.** | **Switched to previous model with less layers and reduce height and width to 60 from 120.** |
| **6.** | **Conv3d** | **0.7059** | **0.6800** | **Seen good improvement in model.** | **Changed batch size to 20 to see improvement.**  **Decided to further increase in Batch size.** |
| **7.** | **Conv3D** | **0.8406** | **0.6250** | **Further improvement in Accuracy but model tends to overfit.** | **Model shows good improvement, further increasing batch size.** |
| **8.** | **Conv3D** | **0.7785** | **0.6000** | **Accuracy remains almost same but less overfit.** | **Lets further increase batch size.** |
| **9.** | **Conv3D** |  |  | **Failed with OOM error.** | **Model is not able to run, failing with OOM error to train model with more batch size.** |
| **10** | **Conv3D** | **0.5640** | **0.6167** | **Validation accuracy is more than training accurecy.** | **Changed height and width to 100.**  **Shows signs to weak data, so we decided to use 120 height and width and batch size of 40 and frames of 30 till now.** |
| **11** | **Conv3D**  **- AdaDelta** | **0.8651** | **0.6833** | **Accuracy increases by fair decent number.** | **Accuracy increases and model tends to over-fit, signs of good model but computational time increases so we decided to stay with Adam** |
| **12** | **Conv2D+ LSTM** | **0.2438** | **0.2100** | **Less accuracy as compared to CNN3D** | **Model with 1conv2D + LSTM layer shows good trend but less accuracy comparing to Conv3D model and no of parameters increased a lot.** |
| **13** | **Conv2D + LSTM** | **0.4804** | **0.4800** | **Changing Architecture increases accuracy and less parameters.** | **Reduces parameters changes accuracy as well but still computationally expensive and less accuracy compared to Conv3D.** |
| **14** | **VGG16+GRU** | **0.3039** | **0.2200** | **Accuracy is less compared to previous model** | **Using transfer learning VGG16 + GRU reduced the computational time but not much improvement in accuracy.** |
|  |  |  |  |  |  |
| **Final Model** | **Conv3D** | **0.8581** | **0.8000** | Decent training accuracy of 86% and validation accuracy of 80%.  epochs = 50  batch = 40  Size of Training Data 663  Size of Validation Data 100  No of frames in train data 30  Height of Input image 120  Width of Input image 120 | **Ran the final model with 50 epochs and batch size 40 and heigth-width as 100 with 30 frames, we decided to use resize instead of cropping as with cropping we are losing information.**  **We got decent accuracy 86%** |