| **Model** | **Experimental** | **Result** | **Decision + Explanation** | **Parameters** |
| --- | --- | --- | --- | --- |
| **CONV 3D** | **1** | **OOM Error** | **Reduce the batch size and reduce the number of neurons in Dense Layer** |  |
| **2** | **Training Accuracy : 00.97**  **Validation Accuracy : 00.23** | **Overfitting. Let’s add some Layers** | **1,117,061** |
| **3** | **Training Accuracy : 00.94**  **Validation Accuracy : 00.92** | **Let's try lowering the learning rate to 0.0002** | **3,638,981** |
| **4** | **Training Accuracy : 00.72**  **Validation Accuracy : 00.49** | **Overfitting has been reduced. Lets try adding some more layers** | **1,762,613** |
| **5** | **Training Accuracy : 00.82**  **Validation Accuracy : 00.85** | **Observed some good improvements. Let’s try adding some dropouts** | **2,556,533** |
| **6** | **Training Accuracy : 00.88**  **Validation Accuracy : 00.36** | **Overfitting increased. Adding dropouts has further reduced validation. Lets try to reduce the parameters** | **2,556,533** |
| **7** | **Training Accuracy : 00.82**  **Validation Accuracy : 00.71** | **Overfitting is reduced but still the validation accuracy is low. Let’s try to reduce parameters further** | **696,645** |
| **8** | **Training Accuracy : 00.82**  **Validation Accuracy : 00.87** | **Improvement in Validation accuracy. Let’s switch to CNN+LSTM** | **504,709** |
| **CNN+LTM** | **9 (model 8 on notebook)** | **Training Accuracy : 00.96**  **Validation Accuracy : 00.89** | **CNN-LSTM we get the best validation accuracy of 89%** | **1,657,445** |
| **Let’s apply some Data Augmentation and check the performance** | | | | |
| **CONV 3D** | **10** | **Training Accuracy : 00.83**  **Validation Accuracy : 00.78** | **(3,3,3) Filter & 160x160 Image resolution** | **3,638,981** |
| **11** | **Training Accuracy : 00.72**  **Validation Accuracy : 00.56** | **(2,2,2) Filter & 120x120 Image resolution** | **1,762,613** |
| **12** | **Training Accuracy : 00.71**  **Validation Accuracy : 00.81** | **Adding more layers** | **2,556,533** |
| **13** | **Training Accuracy : 00.64**  **Validation Accuracy : 00.21** | **Let’s reduce the parameters** | **2,556,533** |
| **14** | **Training Accuracy : 00.80**  **Validation Accuracy : 00.79** | **After reducing networks parameters, model performance is quite good** | **696,645** |
| **15** | **Training Accuracy : 00.81**  **Validation Accuracy : 00.82** | **Reducing Network Parameters again** | **504,709** |
| **CNN LSTM with GRU** | **16** | **Training Accuracy : 00.97**  **Validation Accuracy : 00.83** | **Overfitting is considerably high. Not much improvement** | **2,573,925** |
| **Transfer Learning (optional)** | **17** | **Training Accuracy : 00.89**  **Validation Accuracy : 00.79** | **We are not training the mobilenet weights and we see validation accuracy is not better** | **3,840,453** |
| **Transfer Learning with GRU (Optional)** | **18** | **Training Accuracy : 00.99**  **Validation Accuracy : 00.98** | **Great result** | **3,693,253** |