The decision to select models was primarily driven by the validation accuracy. Models such as conv\_3d2\_model and conv\_3d10\_model, with validation accuracies of 85% and 86% respectively, were chosen due to stable and high performance without overfitting. However, some models like conv\_3d1\_model and rnn\_cnn1\_model showed overfitting issues, prompting adjustments like data augmentation and layer reduction. It's noteworthy that rnn\_cnn\_tl2\_model achieved the highest validation accuracy at 96%, albeit with a high training accuracy of 99%.

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| --- | --- | --- | --- |
| **Experiment Number** | **Model** | **Result** | **Decision + Explanation** |
| **1** | **conv\_3d1\_model** | **Validation accuracy 78%** | **Model is over-fitting. Augment data using cropping.** |
| **2** | **conv\_3d2\_model** | **Validation accuracy 85%** | **Model is not over-fitting** |
| **3** | **conv\_3d3\_model** | **Validation accuracy 85%** | **Model has stable results. Also, we were able to reduce the parameter size by half.** |
| **4** | **conv\_3d4\_model** | **Validation accuracy 76%** | **With more layers added model is over-fitting.** |
| **5** | **conv\_3d5\_model** | **Validation accuracy 70%** | **Adding dropouts has further reduced validation accuracy** |
| **6** | **conv\_3d6\_model** | **Validation accuracy 77%** | **Reducing the number of network parameters by reducing image resolution/ filter size and dense layer neurons. Comparably good validation accuracy** |
| **7** | **conv\_3d7\_model** | **Validation accuracy 77%** |  |
| **8** | **conv\_3d8\_model** | **Validation accuracy 78%** |  |
| **9** | **rnn\_cnn1\_model (CNN-LSTM)** | **Validation accuracy 75%** | **Model is over-fitting. Let’s try reducing the number of layers in next iteration** |
| **10** | **conv\_3d10\_model** | **Validation accuracy 86%** |  |
| **11** | **conv\_3d11\_model** | **Validation accuracy 78%** |  |
| **12** | **conv\_3d12\_model** | **Validation accuracy 81%** |  |
| **13** | **conv\_3d13\_model** | **Validation accuracy 31%** |  |
| **14** | **conv\_3d14\_model** | **Validation accuracy 77%** |  |
| **15** | **conv\_3d15\_model** | **Validation accuracy 75%** |  |
| **16** | **conv\_3d16\_model** | **Validation accuracy 76%** |  |
| **17** | **rnn\_cnn2\_model (CNN-LSTM)** | **Validation accuracy 78%** |  |
| **18** | **rnn\_cnn\_tl\_model** | **Highest validation accuracy 56%** | **Corresponding Training 85%** |
| **19** | **rnn\_cnn\_tl2\_model** | **Highest validation accuracy 96%** | **Corresponding Training 99%** |