This document lists the models experimented and the reasons for picking the right one.

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| **Model number,**  **Type and Name** | **Result** | **Parameters** | **Decision + Explanation** |
| **Model 1, Conv3D** | **Training and Validation accuracy – 93%, 26%**  **Training and Validation Loss – 0.233, 3.11** | **699,269** | **Since the model is overfitting, we have to reduce it. Add dropouts.** |
| **Model 2, Conv3D** | **Training and Validation accuracy – 84.99%, 25%**  **Training and Validation Loss – 0.40, 4.83** | **1,967,813** | **Overfitting is persistent. Reduce the filter size and image resolution.** |
| **Model 3,**  **Conv3D** | **Training and Validation accuracy – 70.8%, 23%**  **Training and Validation Loss – 0.80, 7.10** | **1,762,613** | **Training accuracy feel slightly and validation accuracy is a bit closer to training. Overfitting is still an issue. Add more layers.** |
| **Model 4,**  **Conv3D** | **Training and Validation accuracy – 84.9%, 35%**  **Training and Validation Loss – 0.39, 3** | **2,556,533** | **The model parameters are way too high. Reduce the model size and check performance.** |
| **Model 5,**  **Conv3D** | **Training and Validation accuracy – 83.94%, 26%**  **Training and Validation Loss – 0.44, 4** | **696,645** | **Low memory footprint, overfitting is still a challenge. Move on to CNN-LSTM model.** |
| **Model 6,**  **CNN+LSTM** | **Training and Validation accuracy – 94.12%, 51%**  **Training and Validation Loss – 0.20, 1.71** | **1,657,445** | **The validation accuracy has gone up finally. Lets augment with rotation and check for improvement.** |
| **Model 7,**  **Conv3D + Aug** | **Training and Validation accuracy – 80.69%, 34%**  **Training and Validation Loss – 00.54, 0.34** | **2,254,133** | **Augmentation is stabilizing the model. Lets reduce the parameters to fix overfitting.** |
| **Model 8, Conv3D + Aug + Reduction of network parameters** | **Training and Validation accuracy – 84.16%, 86.00%**  **Training and Validation Loss – 00.47, 0.51** | **627,589** | **The model looks awesome!**  **With great training ang validation accuracy, this model is promising.**  **Lets augment CNN-LSTM with GRU, to check if this is any better than this model.** |
| **Model 9,**  **CNN+LSTM with GRU** | **Training and Validation accuracy – 95.32%, 77.00%**  **Training and Validation Loss – 00.19, 0.70** | **2,573,925** | **There is improvement on the validation accuracy when compared to the plain CNN+LSTM, but inferior to Model 8.**  **We conclude that the Model 8 is correct in many respects, and we go with that for testing.** |