Experiments with combinations of different layers, architectures, image shapes, no. of frames per video, batch sizes, etc. have been done and the results obtained have been jotted down as under:

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| **Experiment Number** | **Model** | **Result** | **Decision + Explanation** |
|  | Conv3D | categorical\_accuracy: 0.9985  val\_categorical\_accuracy: 0.5500 | Used only 20% of the training and validation data.  Model is able to overfit the data successfully. |
|  | Conv3D | categorical\_accuracy: 0.9506  val\_categorical\_accuracy: 0.4000 | Reduced the size of images to (75,75) to see the effect of reduction in no. of input features.  Model accuracy decreased a little due to reduction in no. of features. |
|  | Conv3D | categorical\_accuracy: 0.9855  val\_categorical\_accuracy: 0.4750 | Increased the data usage from 20% to 40% to see whether the model is still overfitting  Model is still overfitting after increasing the feed data. |
|  | Conv3D | categorical\_accuracy: 1.0000  val\_categorical\_accuracy: 0.4500 | Increased the data usage from 40% to 80%.  Model is still overfitting. So we should use full data from now on |
|  | Conv3D | categorical\_accuracy: 0.7274  val\_categorical\_accuracy: 0.4900 | Increase the data from 80% to 100%.  And Increase the batch size from 5 to 20.  Training accuracy decreased drastically upon using 20 batch size. |
|  | Conv3D | categorical\_accuracy: 0.8681  val\_categorical\_accuracy: 0.4500 | Decrease the batch size from 20 to 10.  We are getting good training accuracy. We would have to experiment with the learning rate, in case we want to increase the batch size of the feed in data. |
|  | Conv3D | categorical\_accuracy: 0.8803  val\_categorical\_accuracy: 0.4700 | Increase the no. of frames per video (i.e. img\_idx) from 6 to 15 to see whether we get any reduction in overfitting.  Both the accuracies improved a little but the Model is still overfitting. |
|  | Conv3D | categorical\_accuracy: 0.9950  val\_categorical\_accuracy: 0.7114 | With the help of Generator output plotting, it was figured that the sequence of images was not sorted and hence there was issue with the time axis. Corrected the input image generator sequence.  Model Overfitting is reduced. |
|  | Conv3D | categorical\_accuracy: 0.9929  -val\_categorical\_accuracy: 0.7171 | Added one more CNN3D layer to reduce the problem of model overfitting.  Model performance improved. |
|  | Conv3D | categorical\_accuracy: 0.9882  val\_categorical\_accuracy: 0.7029 | Used dropout to tackle the issue of overfitting.  overfitting is not reducing any further. |
|  | ConvLSTM2D | categorical\_accuracy: 0.2066  val\_categorical\_accuracy: 0.2029 | Using single ConvLSTM2D  Got very arbitrary results. Need to increase the no. of LSTM layers as model is not properly fitting the dataset. |
|  | ConvLSTM2D+LSTM | categorical\_accuracy: 0.8039  val\_categorical\_accuracy: 0.5257 | Using 1 ConvLSTM2D and 1 LSTM layer inorder to properly fit the data.  Got drastic improvement in the model fitting. |
|  | CNN+GRU | categorical\_accuracy: 0.7994  val\_categorical\_accuracy: 0.5143 | Using timedistributed CNN layers inorder to properly fetch the features of different frame of videos, and GRU layer to reduce the no. of trainable parameters.  Result improved but the model is still overfitting. |
|  | CNN+GRU | categorical\_accuracy: 0.9299  val\_categorical\_accuracy: 0.6514 | Using timedistributed CNN layers along with MaxPooling layers to regularize the model.  Using an additional dense layer with Dropout to regularize the model further.  We good improvement in the result but the model is still overfitting. |
|  | CNN+GRU | categorical\_accuracy: 0.9829  val\_categorical\_accuracy: 0.7057 | Increasing the no. of output from GRU units from 20 to 64 and finally to 128 since the result was improving.  We got improved training and validation accuracy. But the model is highly overfitting.  Decided to get back to the reduced no. of outputs from GRU units |
| Final Model | CNN+GRU | categorical\_accuracy: 0.9925 val\_categorical\_accuracy: 0.7800 | Reduced the no. of outputs from GRU units to 16.  We got improved training and validation accuracy. We are considering this as our final model for submission. |