

*All Models are using the same image indexes and image size*

*image\_index = [0,2,4,8,10,12,14,16,18,20,22,25,29]*

*image\_height,image\_width = 120,120*

*The Best Model is MobileNetV2 + GRU with accuracy of 0.79 and val accuracy of 0.73*

Experiment Number	Model	Result	Decision + Explanation
1	Conv3D	Accuracy: 0.38  Val Accuracy: 0.42	We are using 3 cnn layers to capture features from video frames. We have taken batch size 100 to reduce the number of back propagations so that model could train fast. Number of epochs is 15.  Trainable params: 295,301  Batch size: 100  epochs:15  Conclusion:  Model is not crossing 40 - 50% accuracy. Best guess is due to batch size. Batch size is 100 reducing batch size should increase the accuracy
2	Conv3D	Accuracy:0.7143  Val Accuracy: 0.7500  Epoch: 14/15	We are using the same architecture as experiment 1 but we have decreased the batch size which will in turn increase the number of backpropagation done by the network.  Trainable params: 295,301 Batch size:32  epochs:15  Conclusion:

			Model has reached an accuracy of 70% but the model is still not performing well. In certain epochs validation accuracy is higher than accuracy. Best guess is that the model is not complex enough.
3	Conv3D	<b>Accuracy: 0.60</b>  <b>Val Accuracy:0.50</b>  <b>Epoch no: 9/15</b>	<p>We have introduced a new cnn layer to make the model more complex. Now we have 4 cnn3d layers to capture features from the video frames.</p> <p>Trainable params: 294,661 Batch size: 32 epochs: 15</p> <p>Conclusion:</p> <p>Adding an cnn layer made the model overfit on data.</p>
4	CNN2D + GRU	<b>Accuracy: 0.74</b>  <b>Val Accuracy:0.25</b>  <b>Epoch:15/15</b>	<p>We are using 4 CNN2D layers with the TimeDistributed layer to capture features from video frames. We are passing the features to the GRU layer. We are using batch size 32 as that provided better results in the cnn3d model.</p> <p>Trainable Param: 2,556,709 Batch size: 32 epochs: 15</p> <p>Conclusion:</p> <p>Model is overfitting. Best guess is due to the model complexity</p>

5	CNN2D + GRU	<p><b>Accuracy: 0.7563</b></p> <p><b>Val Accuracy: 0.7500</b></p> <p><b>Epoch: 9/15</b></p>	<p>We have removed a CNN2D layer to reduce model complexity. We have increased dropout from 0.1 to 0.2 to handle overfitting.</p> <p>Trainable params: 5,590,709 Batch size: 32 epochs: 15</p> <p>Conclusion: The Model is overfitting but usable.</p>
6	MobileNetV2+GRU (Best Model)	<p>Best Epoch: 12/15</p> <p>Accuracy: 0.79</p> <p>Val Accuracy: 0.73</p>	<p>We are using MobileNetV2 Model with GRU layer.</p> <p>Batch Size: 50 epochs: 15</p> <p>Trainable params: 194,325</p> <p>Conclusion: This is the best model achieved. Reducing the batch size to see whether it would increase performance as it will increase the number of backpropagation.</p>
7	MobileNetV2+GRU	<p><b>Accuracy : 0.84</b></p> <p><b>Val Accuracy: 0.62</b></p> <p><b>Epoch: 10/15</b></p>	<p>We are using the same architecture and just reduced the batch size to 32.</p> <p>Batch size: 32 epochs:15</p> <p>Trainable params: 194,325</p> <p>Conclusion: Reducing batch size did not help. Model is now overfitting.</p>

### **Conclusion of cnn3d Model**

The Best model is for experiment number 2 (Model 2)

Best Epoch: 14/15

Best Accuracy: 0.7143

Best Val Accuracy: 0.7500

### **Conclusion of CNN2D + GRU Model**

Best Model is Experiment 2

Best Epoch: 9/15

Accuracy: 0.7563

Val Accuracy: 0.75

### **Conclusion of CNN2D + GRU Model**

Best Model is experiment 1

Best Epoch: 12/15

Accuracy: 0.79

Val Accuracy: 0.73