**Model Write up: Summary of the Assessments and the corresponding justification:**

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| Model No. | Model | Description | Result | Decision + Explanation |
| 1 | Simple Conv3D | Batch Size: 40 No of Epoch: 10  Trainable Parameters:  51,60,8325 | Cat accuracy: 0.90  Val accuracy: 0.40 | 1. Model is over fit 2. Need to try using Batch Normalization +Dropout with Conv3D 3. Increase no of epoch |
| 2 | Conv3D + Batch Normalization + Dropout | Batch Size: 40 No of Epoch: 20  Trainable Parameters:  51,60,9221 | Cat accuracy: 0.96  Val accuracy: 0.116 | 1. Model is over fit and early stopping and accuracy is not increasing with each epoch 2. Add Global Average Pooling 3. increase no of epoch 4. Reduce parameters |
| 3 | Conv3D + Batch Normalization + Dropout + Global Average Pooling | Batch Size: 40 No of Epoch: 30  Trainable Parameters: 71,0533 | Cat accuracy: 0.88  Val accuracy: 0.17 | 1. Model is still over fit and early stopping and accuracy is not increasing with each epoch 2. Try with GRU instead of LSTM with reduced parameter with same batch size and epoch |
| 4 | Conv2D + GRU + Batch Normalization | Batch Size: 40 No of Epoch: 40  Trainable Parameters: 99,269 | Cat accuracy: 0.76  Val accuracy: 0.13 | 1. Model is still over fit and early stopping and accuracy is not increasing with each epoch 2. Use transfer learning to improve Val accuracy. 3. Try with GRU to save computational effort instead of using LSTM |
| 5 | TransferLearning (VGG16 + GRU + Batch Normalization) | Batch Size: 40 No of Epoch: 20  Trainable Parameters: 2,56,389 | Cat accuracy: 0.93  Val accuracy: 0.66 | 1. Model is still overfitting 2. Try with different transfer learning method 3. Change no of epoch 4. Remove Batch Normalization |

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| 6 | TransferLearning (Mobilenet + GRU) | Batch Size: 40 No of Epoch: 15  Trainable Parameters: 36,69,317 | Cat accuracy: 0.97  Val accuracy: 0.95 | Achieved best Val accuracy compared to all above model. |

**Conclusion:**

Based on the Models 1 to 6, using different learning method's (i.e., Conv3D, Conv2D+GRU, TransferLearning), the Model 6 (composed of TransferLearning from Mobilenet + GRU) gave best accuracy when compared to all above models.