Project Name : Gesture Recognition - 5 Classes

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We started with a Random model and then curated with some hyper parameters as well as applying the other combinations of different architectures.

Experiment Number	Model	Result	Decision + Explanation
1	Conv3D (Batch Size = 164)	Throws Generator error	Started with a larger batch size. Reduce the batch Size
2	Conv3D (Batch Size = 128)	Throws Generator error	Doesn't work and need to reduce the batch Size
3	Conv3D (EPOCH = 15, Batch Size 64)	Training Accuracy : 0.99 Validation Accuracy: 0.50	Upon reducing batch size worked but Looks Overfitting early on. Training Accuracy is too high and Validation Accuracy is too low. Decision - Add Batch Normalization, Dropouts, Increase batch Size
4	Conv3D (EPOCH = 15, Batch Size = 100)	Training Accuracy: 0.81 Validation Accuracy: 0.24	This has even reduced the accuracy. Though it doesn't seem overfitting, accuracy is not good. 50% dropout has lost much information it seems. Decision - Same Model but more in depth by adding more neurons in the layer. And changing back the Batch Size to 64.
5	Conv3D (Additional Dense Layer)	Training Accuracy: 1.0	This improved a lot with the addition of a Dense layer.

		Validation Accuracy: 0.68	**Decision - Try further reducing batch size. And No Dropout.**
6	**Conv3D (Without Dropout)**	**Training Accuracy: 0.98** **Validation Accuracy: 0.67**	**This is by far a good model with the lowest parameter.** **Decision - Next, We can try with Transfer learning or other LSTM models.**
7	**Conv3D (Batch Size = 32)**	**Training Accuracy: 0.92** **Validation Accuracy: 0.63**	**Just another trial with reduced batch size but this is not adding any value.**
8	**ResNet50 (Transfer Learning)** **GRU**	**Training Accuracy: 0.94** **Validation Accuracy: 0.83**	**Transfer Learning Conv2D using ResNet50 and using GRU technique result looks much better.**
9	**resnet50_transfer (Transfer Learning)** **LSTM**	**Training Accuracy: 0.97** **Validation Accuracy: 0.90**	**With LSTM getting better training accuracy. This is best model and model of choice as it gives perfect fit and no overfitting.**
Final Model	**Model 9** **resnet50_transfer (Transfer Learning)** **LSTM**	**Training Accuracy: 0.97** **Validation Accuracy: 0.90**	**This gives the perfect combination of a small size model and best fit without overfitting.**

**Note: We observed minor deltas in the accuracy result while running on various machines. We tried running into Jarvis Instance, Google Collab and Local Machine.