

Project Name : Gesture Recognition

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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: 0.60	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: 0.80 Validation Accuracy: 0.45	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: 0.61	Decision - Try further reducing batch size. And No Dropout.
6	Conv3D (Without Dropout)	Training Accuracy: 1 Validation Accuracy: 0.65	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: 0.96 Validation Accuracy: 0.66	Just another trial with reduced batch size but this is not adding any value.
8	ResNet50 (Transfer Learning) GRU	Training Accuracy: 0.91 Validation Accuracy: 0.71	Transfer Learning Conv2D using ResNet50 and using GRU technique result looks much better.
9	resnet50_transfer (Transfer Learning) LSTM	Training Accuracy: 0.93 Validation Accuracy: 0.65	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 8 ResNet50 (Transfer Learning) GRU	Training Accuracy: 0.91 Validation Accuracy: 0.71	This gives the perfect combination of a small size model and best fit without overfitting.