Gesture_Recognition:

Group Members:

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Writeup:

Final model: Model 12

Model No.	Model Description	Results	Comments
0.	- Images taken=30 (All) - Batch size=150/100 - Epochs=25 - Image size=160*160 - Activation="relu" - Optimizer=Adam	Memory error when batch size is 150 and takes longer training period for 160*160 images	Need to reduce batch size

1.	- Conv 3d - Images taken= All - Batch size=50 - Epochs=25 - Image size=130*130 Activation="relu"
	 Lr=0.001
		Train_Accuracy=21.43%
		 Val_Accuracy=25
		 Paramneters=
		 `Trainable params: 189,140,069`
		 `Non-trainable params: 384`
			Need to improve accuracy and reduce parameters.Checking with few changes to model

2.	- Conv 3d - Images taken= All - Batch size=50 - Epochs=20 - Image size=80*80 Activation="sigmoid" - Lr=0.001	Train_Accuracy=14%
		 Val_Accuracy=50
		 Paramneters=
		 `Trainable params: 63,900,773`
		 `Non-trainable params: 384`
			Overfitting.

3.	- Conv 3d - Images taken= 18(alternate) - Batch size=50 - Epochs=14(early stopping) - Image size=100*100 Activation="relu"	Train_Accuracy=21.43% Val_Accuracy=50% Paramneters=	Overfitting

		`Trainable params: 52,202,597 Non-trainable params: 384`	
4.	• Conv 3d • Images taken= 15(alternate) • Batch size=64 • Epochs=25 • Image size=100*100 Activation="relu"	Train_Accuracy=19.23% Val_Accuracy=25 Paramneters= `Trainable params: 52,202,597 Non-trainable params: 384`	No improvement in accuracy
5.	• Conv 3d • Images taken= 18 • Batch size=64 • Epochs=30 • Image size=100*100 Activation="elu"	Train_Accuracy=09% Val_Accuracy=25% Paramneters= `Trainable params: 40,634,373 Non-trainable params: 1,280`	Underfitting.Need to crop images and remove dropout layer
6.	• Conv 3d • Images taken= 18 • Batch size=64 • Epochs=15 • Image size=100*100 Activation="elu" Cropped images Removed dropout	Train_Accuracy=22.7% Val_Accuracy=25 Paramneters= `Trainable params: 40,634,373 Non-trainable params: 1,280`	Needs improvement in accuracy
7.	• Conv 3d • Images taken= 18 • Batch size=64 • Epochs=15 • Image size=100*100 Activation="elu"	Train_Accuracy=22.7% Val_Accuracy=75 Paramneters= `Trainable params: 40,634,373 Non-trainable params: 1,280`	Model overfitting.
8.	• Conv 3d • Images taken= 18 • Batch size=100 • Epochs=25 • Image size=100*100 • Activation="elu" • Reduced lr to 0.0001	Train_Accuracy=22.7% Val_Accuracy=25 Paramneters= `Trainable params: 40,634,373 Non-trainable params: 1,280`	No improvement Need to increase epoch

9.	• Conv 3d
	• Images taken= 18
	• Batch size=64
	• Epochs=40
	• Image size=100*100
	• Activation="elu"
	• Changed optimizer to SGD
		Train_Accuracy=35.7%
		Val_Accuracy=50
		Paramneters=
		`Trainable`
		`params:`
		`40,634,373`
		`Non-trainable`
		`params: 1,280`
			Model overfitting.

10.	• Conv 3d • Images taken= 18 • Batch size=40 • Epochs=22(early stopping) • Image size=100*100 • Activation="relu" • Changed optimizer to Adam • Transfer learning using mobilenet and GRU	Train_Accuracy=64.7% Val_Accuracy=50 Paramneters=	Model overfitting. Changeing activation function to elu.

11.	• Images taken= 18
	• Batch size=40
	• Epochs=22(early stopping)
	• Image size=100*100
	• Activation="elu"
	• Changed optimizer to Adam
	Transfer learning using mobilenet and GRU
		Train_Accuracy=82.35%
		Val_Accuracy=83.33%
		Paramneters=
		`Trainable`
		`params:`
		`3,669,317`
		`Non-trainable`
		`params: 23,936`
			Good accuracy.Can be improved.Changing batch size to 50

12.	• Images taken= 18
	• Batch size=50
	• Epochs=25
	• Image size=100*100
	Activation="elu"
	• optimizer = Adam
	Transfer learning using mobilenet and GRU
		Train_Accuracy=96.43%
		Val_Accuracy=100%
		Paramneters=
		`Trainable`
		`params:`
		`3,669,317`
		`Non-trainable`
		`params: 23,936`
			Good accuracy with reduced parameters

13.	• Conv 3d
	• Images taken= 18
	• Batch size=60
	• Epochs=25
	• Image size=100*100
	Activation="elu"
		Train_Accuracy=87.5%
		Val_Accuracy=100
		Paramneters=
		`Trainable`
		`params:`
		`3,669,317`
		`Non-trainable`
		`params: 23,936`
			Accuracy reduced Improvement not seen further.So finalizing Model 12.

Finalizing Model 12 as it has highest accuracy and less number of parameters