Gesture Recognition Case Study:

We have started with 3D Conv model , that will be able to predict the 5 gestures then we have done an another model on 2D conv Model with RNN(CNN+RNN) Using transfer leaning.

Model uploaded : <https://drive.google.com/file/d/1E9UY_0mWFKm-bDYtPHAB-AGzGqhmIMnt/view?usp=sharing>

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| **Experiment Number** | **Model** | **Result** | **Decision + Explanation** |
| **1** | **Conv3D** | **Accuracy: 20** | **Add the selective images from a sequence. Resized the image and added the normalization. With the batch size as 500 and epoch as 1**  **Y = 120, Z=120. Tried with Adam optimizer.** |
| **2** | **Conv3D** | **Resource exhausted error is populated** | **Increased the epoch from 1st experiment.** |
| **3** | **Conv3D** | **Resource exhausted error is populated** | **Add the selective images = 18. Done the Resized on image and added the normalization. With the batch size as 64 and epoch as 30**  **Y = 84, Z=84. Tried with SGD optimizer.** |
| **4** | **Conv3D** | **Accuracy: 69%** | **Reduced the batch and Epoch:**  **With the batch size as 40 and epoch as 10**  **Y = 84, Z=84. Tried with SGD optimizer.** |
| **5** | **Conv3D** | **Resource exhausted error is populated** | **Changed the size of y,z to 120 , batch size as 32 and epoch as 20 with adam optimizer** |
| **6** | **Conv3D** | **Accuracy: 67** | **Changed the size of y,z to 90 , batch size as 20 and epoch as 10 with adam optimizer** |
| **7** | **Conv 3D** | **Accuracy: 75** | **Changed the size y,z to 84 and optimizer as SGD, epoch as 18, batch size as 25** |
| **8** | **Conv 3D** | **Accuracy: 78** | **Changed the size y,z to 84 and optimizer as Adam(lr=0.0001) , epoch as 18, batch size as 25**  **Validation accuracy and loss there were huge spikes were observed and model was not convergent to optima.** **So we changed lr to 0.0001 and then we got 78 % accuracy** |
| **9** | **Conv 3D** | **Accuracy : 82** | **Considered all 30 frames, Batch size as 20 , epoch as 18 , SGD optimizer.**  **Refer:** model-00018-0.49701-0.79487-0.64238-0.82000.h5 |

**CNN+RNN Model:**

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| **1** | **ConvGRU** | **Accuracy: 71** | **Batchsize: 15**  **Epoch = 20**  **Images = 18**  **Tried with VGG16 pretrained model with adam optimizer and GRU** |
| **2** | **ConvLSTM** | **Accuracy: 59** | **Batchsize: 15**  **Epoch = 20**  **Images = 18**  **Tried with VGG16 pretrained model with adam optimizer and LSTM** |
| **3** | **ConvGRU** | **Accuracy: 86** | **Tried with mobilenet pretrained model with adam optimizer**  **batch\_size = 10**  **num\_epochs = 25**  **Images = 18** |
| **4** | **ConvGRU** | **Accuracy: 79** | **Tried with mobilenet pretrained model with Adam optimizer**  **batch\_size = 10**  **num\_epochs = 25**  **Images = 30** |
| **5** | **ConvGRU** | **Accuracy: 82** | **Tried with mobilenet pretrained model with SGD optimizer**  **batch\_size = 10**  **num\_epochs = 25**  **Images = 30**  **Refer:** model-00025-0.08685-0.98492-0.44782-0.82000.h5 |