This is a sample write-up. The write-up need not be in tabular form.

It doesn’t state that ConvLSTM will give you better results than Conv3D. The explanation should be as detailed as possible so that the logic behind the decision is conveyed. Also, there are a lot of things you can experiment with in the generator function and elsewhere. Please do not forget to specify the exact metric values, here Accuracy which drives your decision.

You can draw inspiration from the concepts taught in the Industry demo in CNNs to experiment with the data and different architectures.

|  |  |  |  |
| --- | --- | --- | --- |
| **Experiment Number** | **Model** | **Result** | **Decision + Explanation** |
| **1** | **Conv3D** | **Validation Accuracy – 70.83**  **Training Accuracy – 65.07**  **Parameters – 381,317** | **Batch : 15**  **Epoch : 20**  **Frames : 10**  **Pixels : 100 X 100**  **Channels : 3**  **Model :**  **1. Conv3D - 8 Layers - Same Padding - with Kernal Size (3,3,3)**  **Relu Activation**  **MaxPooling2D - (2,2,2)**  **BatchNormalization**    **2. Conv3D - 16 Layers - Same Padding - with Kernal Size (3,3,3)**  **Relu Activation**  **MaxPooling3D - (2,2,2)**  **BatchNormalization**    **3. Conv3D - 32 Layers - Same Padding - with Kernal Size (3,3,3)**  **Relu Activation**  **MaxPooling3D - (2,2,2)**  **BatchNormalization**    **4. Conv3D - 32 Layers - Same Padding - with Kernal Size (3,3,3)**  **Relu Activation**  **MaxPooling3D - (2,2,1)**  **BatchNormalization**    **5. Conv3D - 64 Layers - Same Padding - with Kernal Size (3,3,3)**  **Relu Activation**  **MaxPooling3D - (2,2,1)**  **BatchNormalization**  **5. Conv3D - 128 Layers - Same Padding - with Kernal Size (3,3,3)**  **Relu Activation**  **MaxPooling3D - (2,2,2)**  **BatchNormalization**    **DropOut - 0.25**  **Flatten**  **Dense - 256**  **DropOut with 0.50**  **Dense - 128**  **DropOut with 0.50**  **Dense - 64**  **DropOut with 0.50**  **Dense - 5 with softmax activation** |
| **2** | **Conv + RNN (GRU)** | **Validation Accuracy – 70.00**  **Training Accuracy – 74.07**  **Parameters – 1091242** | **Added Conv2D Models with Layers (32,32,32,64,64,128,256)**  **With TimeDistributed**  **Provided Input as :**  **Frames : 10**  **Images : 100 X 100**  **Channels : 3**  **(10,100,100,3)**  **No of Parameters : 1,091,242**  **Batch Size : 25**  **Epochs : 25**  **In Each Layers we have used Kernel and bias L2 regularizer of 0.01**  **Added MaxPooling and BatchNormalization and Dropout** |
| **3** | **CONN + GRU** | **Validation Accuracy – 72.00**  **Training Accuracy – 75.86** | **Added Conv2D Models with Layers (32,32,32,64,64,128,256)**  **With TimeDistributed**  **Provided Input as :**  **Frames : 10**  **Images : 100 X 100**  **Channels : 3**  **(10,100,100,3)**  **No of Parameters : 1,091,242**  **Batch Size : 25**  **Epochs : 30**  **In Each Layers we have used Kernel and bias L2 regularizer of 0.01**  **Added MaxPooling and BatchNormalization and Dropout**  **Flatters with GRU** |
| **Final Model** | **Conv2D + GRU** | **Validation Accuracy - 88.33**  **Training Accuracy - 90.72**  **Parameters :**  **1,273,589** | **Batch : 15**  **Epoch : 20**  **Frames : 10**  **Pixels : 100 X 100**  **Channels : 3**  **Model :**  **1. TimeDistributed - Conv2D - 32 Layers - Same Padding - with Kernal Size (1,1)**  **Relu Activation**  **MaxPooling2D - (3,3) with Strides (2,2)**  **BatchNormalization**    **2. TimeDistributed - Conv2D - 32 Layers - Same Padding - with Kernal Size (3,3)**  **Relu Activation**  **MaxPooling2D - (3,3) with Strides (2,2)**  **BatchNormalization**  **3. TimeDistributed - Conv2D - 64 Layers - Same Padding - with Kernal Size (3,3) and kernel\_regularizer(l2(0.01)) and bias\_regularizer(l2(0.01))**  **Relu Activation**  **BatchNormalization**  **DropOut with 0.25**    **4. TimeDistributed - Conv2D - 64 Layers - Same Padding - with Kernal Size (3,3) and kernel\_regularizer(l2(0.01)) and bias\_regularizer(l2(0.01))**  **Relu Activation**  **MaxPooling2D - (3,3)**    **5. TimeDistributed - Conv2D - 64 Layers - Same Padding - with Kernal Size (3,3)**  **Relu Activation**  **DropOut with 0.25**    **6. TimeDistributed - Conv2D - 128 Layers - Same Padding - with Kernal Size (3,3) and kernel\_regularizer(l2(0.01)) and bias\_regularizer(l2(0.01))**  **Relu Activation**  **DropOut with 0.50**    **7. TimeDistributed - Conv2D - 256 Layers - Same Padding - with Kernal Size (5,5) and kernel\_regularizer(l2(0.01)) and bias\_regularizer(l2(0.01))**  **Relu Activation**    **TimeDistributed - Flatten**  **Dense - 16**  **DropOut with 0.50**  **8. GRU with 64 Layers**  **9. Dense - 5 with softmax activation** |