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| **Experiment Number** | **Model** | **Result** | **Decision + Explanation** |
| **1** | **scipy.misc package issue in reading Image** | **Throws error** | **Error on deprecation of scipy.misc displayed so this impacted reading image files so used imageio** |
| **2** | **Batch size for each Experiment** | **No Error , parameter Batch size was set to 16** | **The batch size set to 16 helped in accuracy and remaining samples of 14 for each image were processed similar** |
| **3** | **Epoch** | **No Error ,Epoch parameter was set to 20** | **Epoch to set the number of iterations for the model to train the dataset and for computation reason this was not set much higher** |
| **4** | **Conv3D + SGD Optimiser** | **Accuracy:20%** | **SGD Optimiser does not work well with sequential data and because of its ability to manage complex features we saw impacts on accuracy.** |
| **5** | **Conv3D + Adam Optimiser** | **Accuracy – 71%**  **Val Accuracy – 55%** | **Adam optimizer is useful for sequential gesture recognition project which will have lot of imbalances.**  **Batch Normalisation before the final layer helps in proper scaled input and helps in faster learning** |
| **6** | **Conv3D + Adam Optimiser + Global Average pooling(Flatten)** | **Accuracy-80%**  **Val Accuracy-69%** | **Global Average pooling was used but did not contribute as in gesture recogonition cases it reduces the information too aggressively losing sequential details.** |
| **7** | **Conv3D + Adam Optimiser + Time Ditributted (Flatten) +GRU** | **Accuracy – 47%**  **Val Accuracy – 43%**  **With Usage of GRU got error on image shape mismatch** | **Time Distributed Flatten layer was added as helps in reading each feature processing independently.**  **But in this using GRU alongside caused image shape mismatch due to incompatible shape** |
| **8** | **Conv3D + Adam Optimiser +LSTM** | **Accuracy -100%**  **Val accuracy – 60%**  **Resulted in Oevrfitting** | **Larger filter size of 128 increased the number of parameters in LSTM layer thereby leading to overfitting** |
| **9** | **Conv3D + Adam Optimiser +LSTM** | **Accuracy – 99%**  **Val Accuracy- 70%** | **LSTM Filter size was reduced to 64 to reduce overfitting and the Drop out parameter was increased to 40% as this reduces reliance on specific neuron.** |
| **10** | **Conv3D + Adam Optimiser +LSTM** | **Accuracy – 99%**  **Val Accuracy- 75%** | **Layer 3 of Conv3D filter size reduced to 64 from 128 thereby reducing memorization of features** |
| **11** | **Conv3D + Adam Optimiser +LSTM** | **Accuracy – 93%**  **Val Accuracy- 75%** | **Drop out parameter was increased to 0.5 for LTSM as this reduces reliance on specific neuron.** |
| **Final Model** | **Conv3D + Adam Optimiser +LSTM** | **Accuracy – 93%**  **Val Accuracy-86%** | 1. **3 layers of Convo3D with 32,32 and 64 size respectively and activation layer with relu** 2. **Dropout of 0.2 was added to minimise unwanted neuron connection and improve validation accuracy** 3. **LSTM layer was applied finally to improve accuracy with Regulariser of 0.01 and drop out of 0.5** 4. **Final Dense layer with activation function of softmax was included to find exact match of the 5 gesture images of the Assignment** |