## Neural Networks Project - Gesture Recognition

For creating Gesture Recognition model, we will start with vanilla CNN model to observe accuracy on train and validation dataset.

|  |  |  |  |
| --- | --- | --- | --- |
| **Experiment Number** | **Model** | **Result** | **Decision + Explanation** |
| **1** | Conv3D with MaxPool3D | Throws Generator error | Crop and normalised images correctly |
| **2** | Conv3D with MaxPool3D | Accuracy: 0.97  Val Accuracy: 0.65 | Reduce the number of layers |
| **3** | Conv3D with MaxPool3D | Accuracy: 0.98  Val Accuracy: 0.70 | Model overfitting on data.  We applied data augmentation to reduce overfitting. |
| **4** | Conv3D with Image Data Augmentation | Accuracy: 0.99  Val Accuracy: 0.95 | Model is giving high accuracy in both training and validation datasets. Experimenting next with Transfer Learning. |
| **5** | MobileNet Transfer Learning with LSTM | Accuracy: 0.82  Val Accuracy: 0.51 | Transfer learning reduced accuracy along with validation accuracy. Here, the model is overfitting. |
| **6** | MobileNet Transfer Learning with GRU | Accuracy: 0.98  Val Accuracy: 0.85 | Increasing data to reduce overfit |
| **7** | MobileNet + GRU with Data Augmentation | Accuracy: 0.97  Val Accuracy: 0.85 | Validation data accuracy does not seem to improve with adding extra data. |
| **Final Model** | Conv3D with Image Data Augmentation | Accuracy: 0.99  Val Accuracy: 0.95  No of params:  592,773 | Model gave high accuracy on both training and validation datasets. |