Following is the list of observations that were noticed during various experiments and the corresponding decisions that were made to arrive at final model.

| **Experiment Number** | **Model** | **Result** | **Decision + Explanation** |
| --- | --- | --- | --- |
| 1 | **Conv3D** | Train Accuracy: 0.48  Validation Accuracy: 0.26 | Overfitting. Try adding drop out layer |
| 2 | **Conv3D** | Train Accuracy: 0.75  Validation Accuracy: 0.23 | Overfitting. Try reducing the learning rate. |
| 3 | **Conv3D** | Train Accuracy: 0.83  Validation Accuracy: 0.70 | Overfitting mode. Decrease learning rate and increase epochs. |
| 4 | **Conv3D** | Train Accuracy: 0.76  Validation Accuracy: 0.67 | Increase the batch size. |
| 5 | **Conv3D** | Train Accuracy: 0.75  Validation Accuracy: 0.62 | No performance gains.  Change learning Rate to 0.001 |
| 6 | **Conv3D** | Train Accuracy: 0.85  Validation Accuracy: 0.77 | Decent accuracy. Try changing optimizer from SGD to Adam. |
| 7 | **Conv3D** | Train Accuracy: 0.98  Validation Accuracy: 0.84 | Overfitting model.  Add dropout layers. |
| 8 | **Conv3D** | Train Accuracy: 0.91  Validation Accuracy: 0.22 | No improvement. Still overfitting. Reduce learning rate and remove dropout. Add more Conv layers. |
| 9 | **Conv3D** | Train Accuracy: 0.87  Validation Accuracy: 0.76 | Overfitting. Make model less complex. Reduced the image to 100x100. |
| 10 | **Conv3D** | Train Accuracy: 0.90  Validation Accuracy: 0.81 | Still over  Fitting. However, loss on deceasing trend. Increase the epoch to 35. |
| 11 | **Conv3D** | Train Accuracy: 0.93  Validation Accuracy: 0.87 | Good accuracy on Train and validation. Training stopped. Model saved along with weights |
| **Final Model** | **Conv3D** | Train Accuracy: 0.92  Validation Accuracy: 0.91 | Fina Model saved to file: “model-00034-0.28494-0.93062-0.42225-0.87000.h5” |
|  | | | |
|  | **Conv2D** | Train Accuracy: 0.98  Validation Accuracy: 0.38 | Overfit. Add dropout layer to GRU |
|  | **Conv2D** | Train Accuracy: 0.95  Validation Accuracy: 0.29 | Overfit. Remove dropout at GRU and reduce image size to 100x100 |
|  | **Conv2D** | Train Accuracy: 0.99  Validation Accuracy: 0.33 | Overfit. Add another Dense Layer of 16 units with dropouts. |
|  | **Conv2D** | Train Accuracy: 0.76  Validation Accuracy: 0.74 | Decent Model. But accuracy low. Add another Conv2D and Dense Layer of 64 units. Add dropouts to Dense layer. |
|  | **Conv2D** | Train Accuracy: 0.97  Validation Accuracy: 0.81 | Good Accuracy. Model saved. |
| **Final Model** | **Conv2D** | Train Accuracy: 0.97  Validation Accuracy: 0.81 | Fina Model saved to file: “model-00022-0.08576-0.97436-0.60434-0.81000.h5” |