**Gesture Recognition Case study**

An innovative gesture recognition feature could enhance user experience significantly at a home electronics company that produces state-of-the-art smart televisions. It would eliminate the need for a remote control by allowing users to control their TV using five distinct gestures.

Based on the data set given, an experiment was conducted to build a model that predicted gestures.

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| **Experiment No** | **Model** | **Hyperparameters** | **Result** | **Decision + Explanation** |
| 1 | conv3D | optimizer=SGD  batch\_size=10  num\_epochs=15  height/width=100 | Train Accuracy: 80,  Validation Accuracy: 73 | Started with the basic/minimum parameters to compare between SGD and Adam optimizers. |
| 2 | conv3D | optimizer=Adam  batch\_size=10  num\_epochs=15  height/width=100 | Train Accuracy: 85,  Validation Accuracy: 79 | Based on the results, Adam optimizer is performing better compared to SGD. Hence rest of the models use Adam as optimizer |
| 3 | conv3D | optimizer=Adam  batch\_size=10  num\_epochs=25  height/width=100 | Train Accuracy: 92,  Validation Accuracy: 87 | In this experiment we increased the epoch value from 15 to 25. This improved the Train Accuracy by 7% and Validation Accuracy by 8% |
| 4 | conv3D | optimizer=Adam  batch\_size=8  num\_epochs=25  height/width=100 | Train Accuracy: 96,  Validation Accuracy: 78 | In this experiment we decreased the batch size to 8. This dropped the validation accuracy but increased the Train Accuracy |
| 5 | conv3D | optimizer=Adam  batch\_size=8  num\_epochs=25  height/width=120 | Train Accuracy: 89,  Validation Accuracy: 81 | Keeping the batch size as 8, We increased the height/width of image to 120. We could see drop in Train Accuracy and Validation Accuracy |
| 6 | conv3D | optimizer=Adam  batch\_size=10  num\_epochs=35  height/width=120 | Train Accuracy: 97,  Validation Accuracy: 81 | In this experiment we reverted the batch size to 10 and we also increased the epoch to 35 which improved the overall results. |
| **Final** | **conv3D** | **optimizer=Adam**  **batch\_size=10**  **num\_epochs=35**  **height/width=100** | **Train Accuracy: 97,  Validation Accuracy: 84** | **For the final experiment we decreased the image height/width from 120 to 100. This was the best result for Train Accuracy and Validation Accuracy.** |

**Conclusion:**

After the final model we can see that using Adam optimizer with batch size 10 and number of epoch as 35 with image size reduced to 100 gave us the best result of Train Accuracy of 97% and Validation Accuracy of 84%. Hence, we conclude this as the best model for the case study.