RESULTS AND DISCUSSIONS

The model was trained on 80% of the pre-processed data using Adagrad optimizer for the categorical cross entropy loss function using an initial learning rate value of 0.001 while using softmax activation for our final dense classification layer to get results as mentioned in the table below. The model was evaluated on the left out 20% of the above data termed as test data. To further test the robustness and performance of our model, another small custom-built dataset termed as real test data was used which includes subjects different from those in the main dataset. Two additional independent test datasets namely ORL and Sunglasses datasets were collected from published resources to further test the generalization capability of our model.

Table 4. Performance metrics for optimized model on different datasets

Dataset	Accuracy	Loss
Train Data (80%)	99.28	0.0326
Test Data (20%)	99.95	0.0026
Real Test Data	100.00	0.0004
ORL Test Data	94.38	0.1472
Sunglasses Test	98.20	0.0962