DATA SOURCE

A custom dataset of non-standard facial images was used to refactor the pre-trained model and update the weights on top layers to make the model robust in making prediction for real-life data. The dataset used for modelling contains a total of 46,372 images belonging to two classes namely eyeglasses present (label-0) and eyeglasses absent (label-1). Three sources of data from which the data was collected are mentioned below.

1. The first part of dataset is custom built wherein, facial image data was collected from few families and friends by requesting them to click and send their pictures with and without eyeglasses in different illuminations and orientations. This part of the dataset involves a total of 4062 images from 20 subjects.
2. The database released by the authors of "An Indian Facial Database Highlighting the spectacles problem contains 123,213 images of 58 subjects with and without eyeglasses in multiple sessions. These images were captured in real-time with different physical conditions like illumination, posture and orientation, alertness level, yawning and different frame types. But due to the huge size of the data from just 58 subjects, using this entire dataset can cause over to overfit on this data. Hence, a random sub-sample of about 30% was selected in equal proportions from each subject to give a total of 37,388 images belonging to both output classes in a balanced ratio.
3. The Kaggle dataset of Glasses or No Glasses containing 4,922 images was used in the third part of our dataset. This dataset contains high-quality pictures and thus bringing diversity to our dataset.

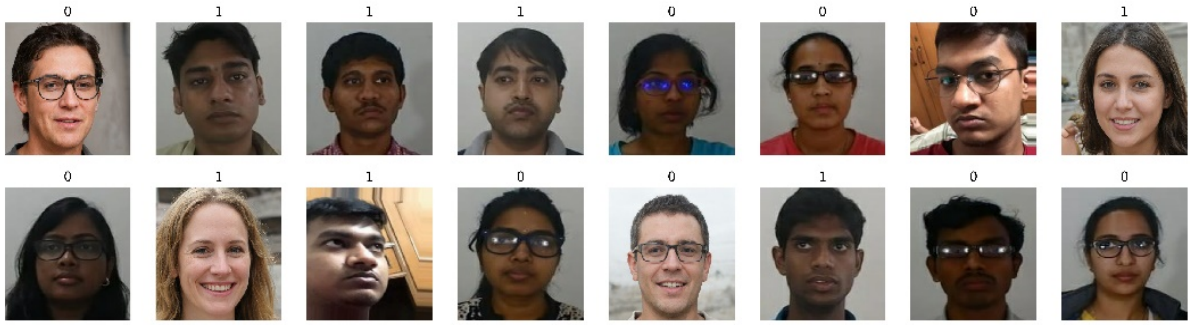

Figure 1. Single batch of 16 images from our labelled dataset

Figure 1 shows a single batch of 16 images from our labelled dataset collected from the three sources as mentioned previously. Apart from this a small dataset of about 400 images was collected from subjects whose images were not used for training for the purpose of testing the real-time performance of our model on images of subjects the model has never seen before. This dataset will be termed as Real Test Data. Additionally, two independent published datasets (ORL and Sunglasses) were used to compare the generalization capabilities of trained model. ORL dataset includes 400 frontal facial images (in grayscale) of 40 different subjects both wearing and not wearing eyeglasses. These images were taken in various lighting and facial expressions. The second independent dataset was collected from Kaggle which includes about 3400 facial images of people with and without sunglasses.