Facial Expression Recognition Model

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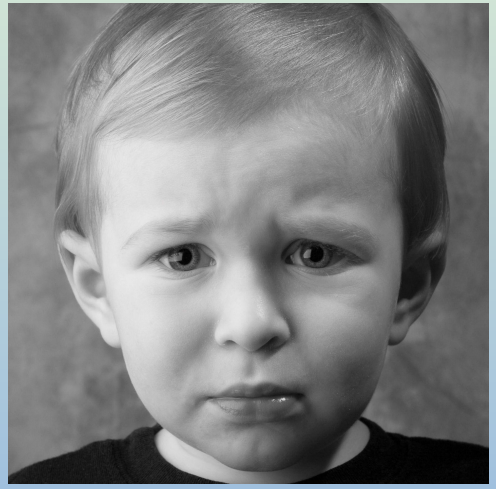
What is Facial Expression?

We, as a human being express ourselves in many ways. Verbally and with nonverbal behavior (for example our facial expression, body language).

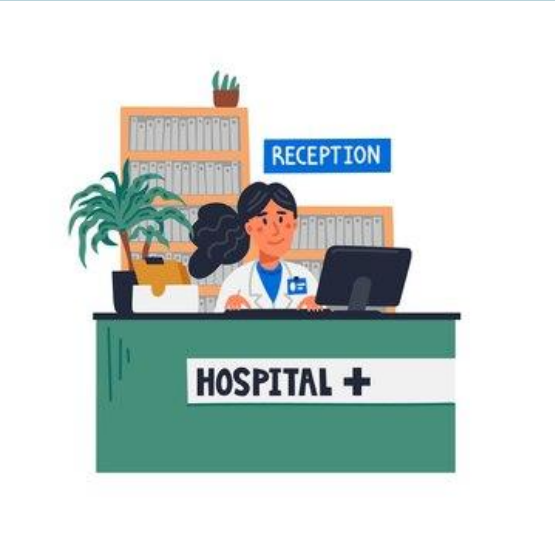
Professor Albert Mehrabian, in 1967, formulated the 7-38-55% communication rule. This rule says that only 7% of feelings we communicate through the words we use, 38%through tone of the voice and 55% through our body language.

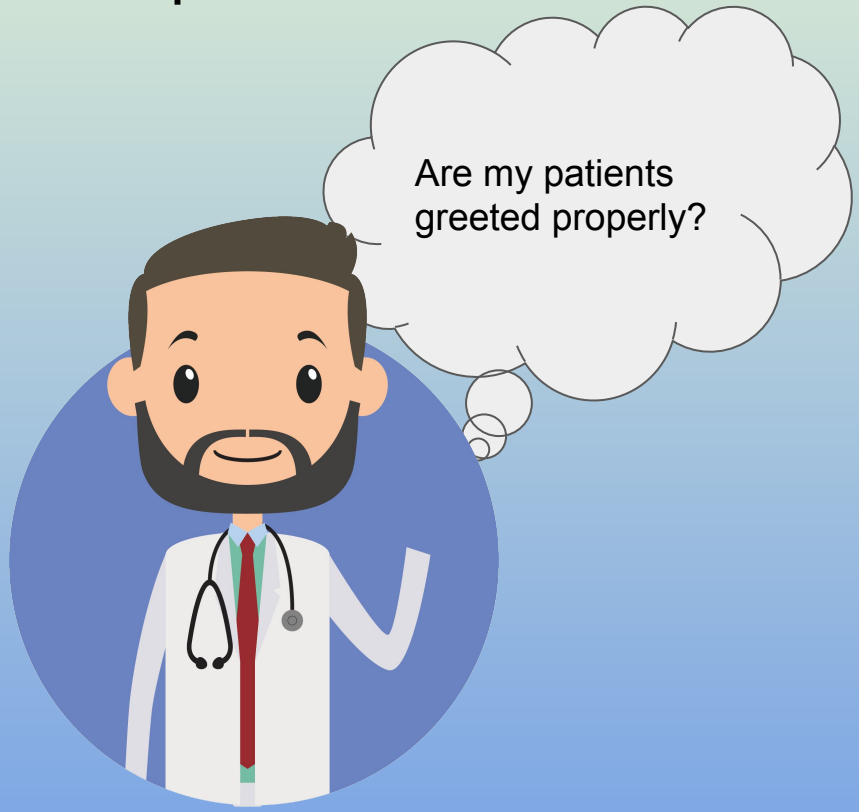
Facial Expressions:



Facial Expressions:

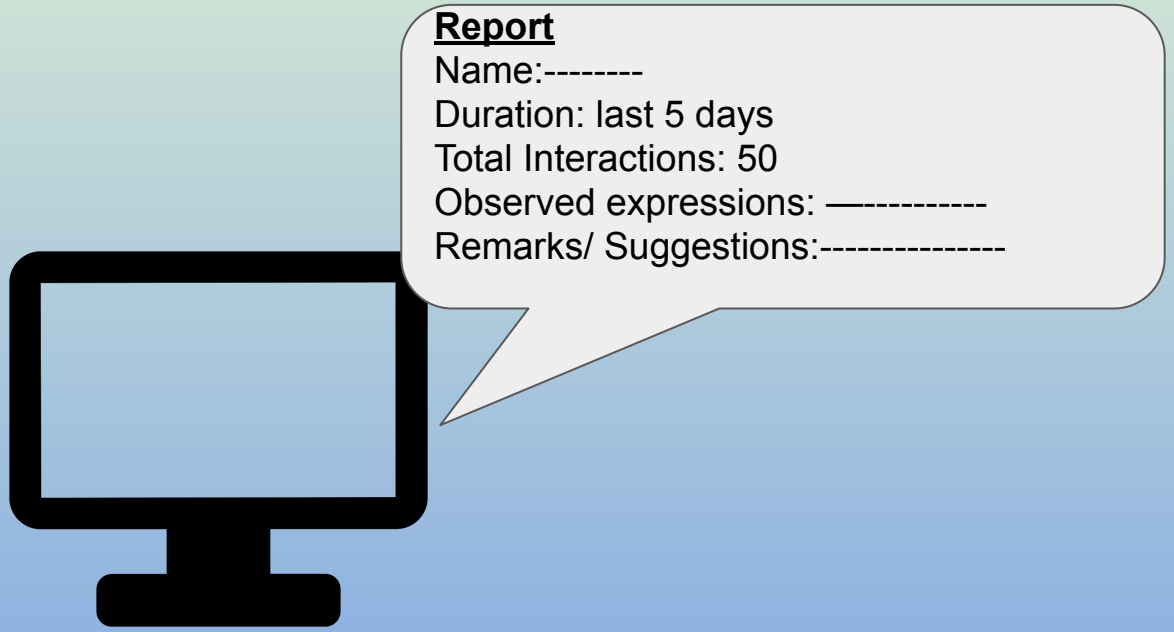
Why do we want machine to comprehend our expressions?





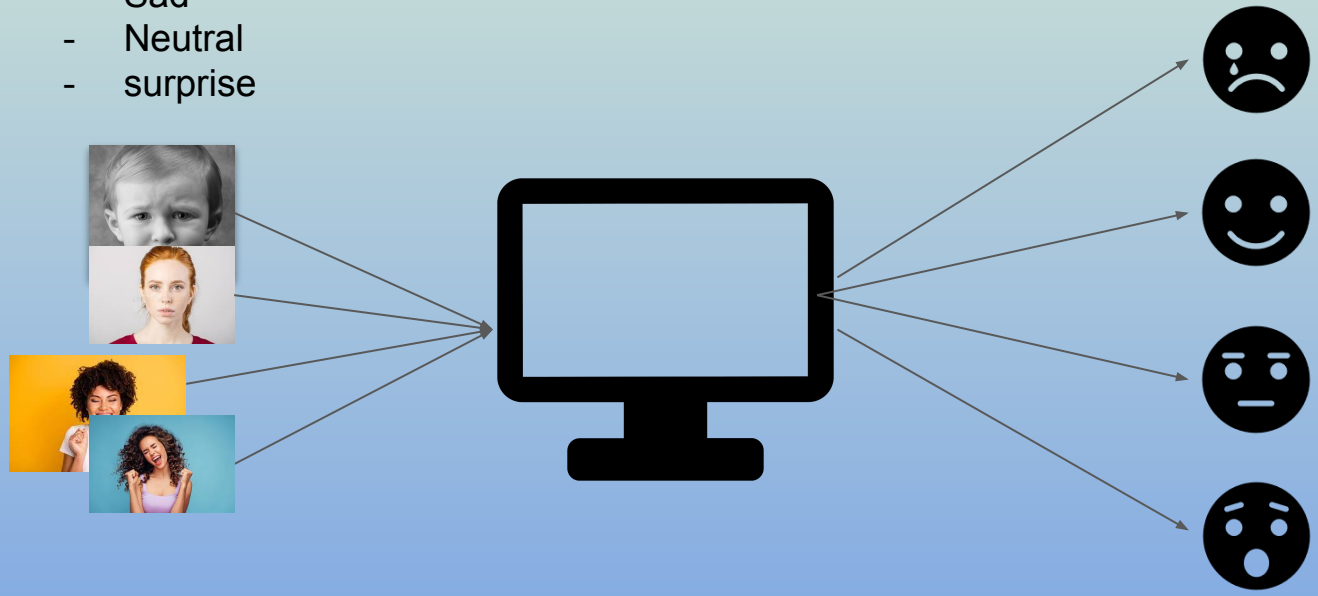
Help??

Do they need help?


Report
Name:--------
Duration: last 5 days
Total Interactions: 50
Observed expressions: —----------
Remarks/ Suggestions:----------

Facial Expression recognition model. Model can classify expressions among below four categories:

- Happy
- Sad
- Neutral
- surprise



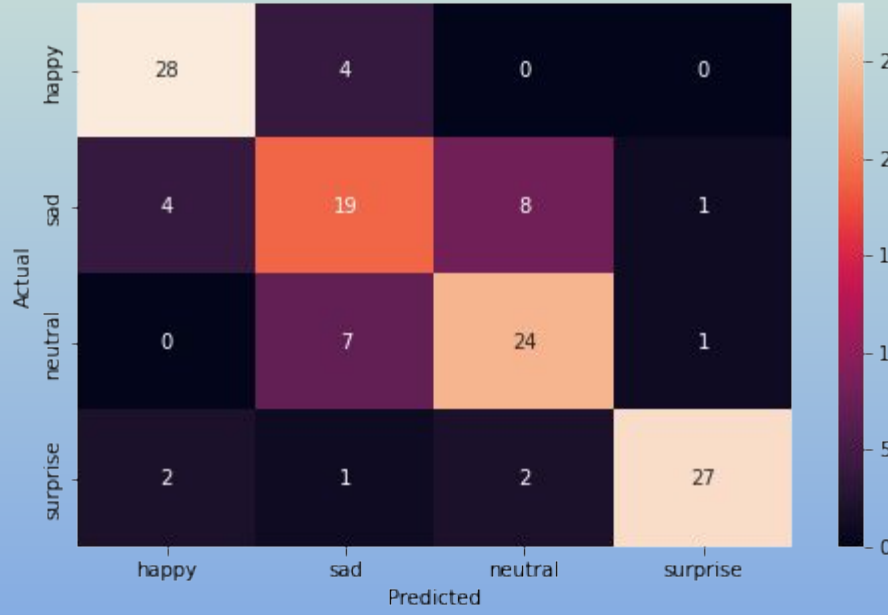
Model Performance:

This model is giving 78.9% of accuracy on test data. Result is below the desired level and target is to take this level to above 90%.

Confusion matrix is providing us more information about the model's classification capability. Below conclusions can be drawn with the help of this matrix:

- Model is struggling more in distinguishing between 'sad' and 'neutral' expressions.
- It is making very few errors in distinguishing 'happy' and 'neutral' expressions from 'surprise' expression.

As a human, sometimes it is difficult for us as well to distinguish between some expressions like 'sad' and 'neutral' however it is very easy to differentiate between 'happy' and 'sad' or 'neutral' expressions. Confusion matrix shows that many 'happy' expressions were wrongly classified, or other expressions were classified as 'happy'. Hence model needs more fine tuning and improvement.



Conclusion:

Distinguishing between human facial expression is tad crucial compared to differentiating between completely different objects. Here, we need to extract very low level of features from the images, combine them and output the desired result.

Our model achieved approx. 78% of accuracy, it is predicting many images correctly however some images are clearly misclassified. So, model has certainly learned some parameters but not enough to be implemented in real life scenario.

It is not a bad model, it has full potential to be converted into a very good classification model. We need to put more effort and time to investigate the problem area where it is failing and improve on that.

Recommendation:

Model is not recommended for practical use. More study and investigation need to be done for sound architecture and better performance.

Thank You !