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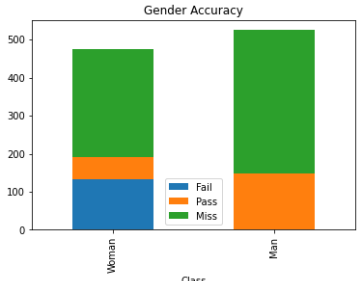
COSI 159A - Computer Vision

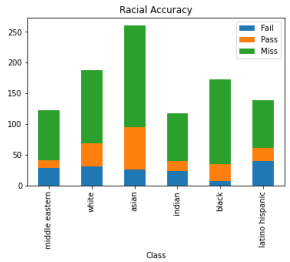
Github Repo: https://github.com/NathanCai2000/COSI159_NathanCai_PA4

Task 2:

Using the faces from Fairface in Deepface, it seems that Deepface consistently fails to even detect most of the pictures given when they are not male or white. The data seems to confirm the observations made in Fairface, as the accuracy of Deepface on the Fairface dataset is suboptimal.



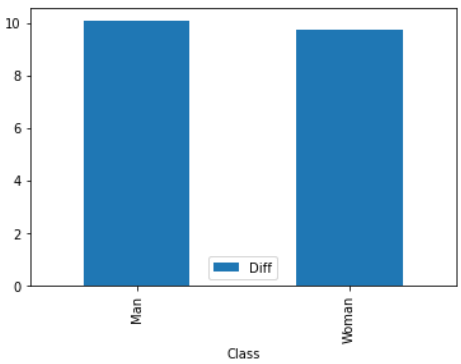
Based on the genders, they have an accuracy of 100% and 28% respectively for Males and Females. Failures in which Deepface fails to detect the face have not been counted towards the final accuracy.

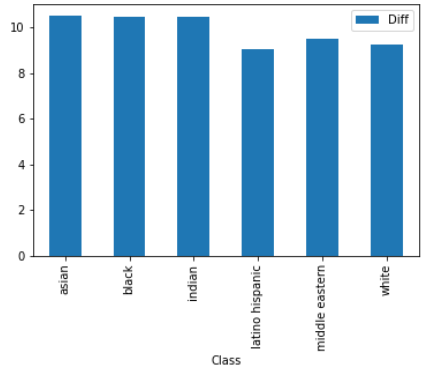


Based on the races, they have an accuracy of 32%, 54%, 73%, 41%, 80%, and 36% respectively for White, Black, Middle Eastern, Indian, Latino Hispanic, and Asian. Since Deepface generalizes East and Southeast Asians into just Asians, I did the same with my analysis. Failures in which Deepface fails to detect the face have not been counted towards the final accuracy.

There does seem to be a bias in the Deepface model, as the age detection for females is more accurate than for males at 33% and 27% respectively. There also seems to be a bias in the age detection between racial groups, most racial groups have an accuracy of 33% +/- 5, with exceptions for middle easterners and blacks with accuracies of 22% and 23% respectively. Failures in which Deepface fails to detect the face have not been counted towards the final accuracy.

There also seems to be a minimal bias in the degree to which the age predictions deviate from the ground truth. It seems that the deviates from Deepface's age detection all sit around 9 to 10 years between genders, and 9 years +/- 1 year between races.





For all figures, I have also included the number of failures in which Deepface was not able to detect a face in the image. The Green sections seem to potentially show a detection bias between genders and certain races.