

Milestone 3 Report

Current State

We are currently on track for Milestone 3 as we were able to achieve some of the goals specified in the proposal for this milestone during Milestone 2. For Milestone 3, we continued building the front end for the web app and linked the Spotify playlists to their corresponding moods, experimenting hyperparameters and various data transformations to improve the model's accuracy, feeding images into a MTCNN model, and integrating the model into our web app.

Spotify playlists were created based on our song recommendation lists for each mood: happy, sad, angry, neutral. After the model predicts users' mood based on their images, the link of the Spotify playlist corresponding to the predicted result is sent to our output webpage (music.html). The Spotify player displays the first 100 songs and users will need to log in Spotify to see our full playlist. Furthermore, users can go back and change their mood to see other playlists.

We explored various hyperparameters and data transformations to try to improve the model's accuracy. However, the accuracy did not increase much compared to Milestone 2. Based on our Milestone 2 feedback, we fed the original data before being trained into a MTCNN model to detect faces. Even though this method did not improve the validation accuracy past 88%, we achieved a 99% training accuracy. This is not only advantageous in training of the model but also to provide more flexibility of where the users can position their faces. For instance, if the webcam captures an image where the user's face is not centered or is far away, we can now make sure that in any condition, the face is extracted.

Our project is near completion as we continue to work on the smaller details for this milestone and the next. We want to ensure we cover all the edge cases and provide a user friendly application for the end result.

Team member's tasks

1. Deepan Chakravarthy

I was again responsible to improve the accuracy of the model. I tried to tweak the hyperparameters more and tried other transformations on the data but the accuracy remained would not increase beyond the 85-88% we have already seen. There were two important changes implemented that went into the updated model. Firstly, I replaced the perspective transform to a random crop transform around the center. This is due to the high probability that faces would appear on the center of images and that backgrounds can be negated for higher accuracy.

Secondly, the original data before being trained was fed into a MTCNN model. The MTCNN extracts only the faces from the background of the images. This processed data can be found in the 'dataset-faces-only' folder. However, when training is done in this

faces-only dataset, validation accuracy did not increase past 88%. However, the training accuracy went from 87% previously to 99% now. This means that the model is training well on the training set and there is some overfitting occurring. Moving forward, my goal will be to try to reduce the overfitting by trying dropout layers or other solutions and try to reach 90% validation accuracy.

2. Aryan Gandhi

For this milestone I worked on ensuring the django file was able to work with a python virtual environment. As well worked on linking the django code to a google cloud server in order to deploy it. Currently it is still being worked on in order to deploy it. However I have added an updated requirements.txt file in the repo in order for the cloud server to know which python libraries to use when deployed.

3. Steve He

I was responsible for finding any bugs and issues in our website and resolving them. I fixed some bugs in the web page structure and integrated the MTCNN model into our webpage so that we crop the picture taken by the user and feed the cropped images (face only) to our sentimental prediction model.

4. Arya Phan

I continued building the front end of our web app. The About page was designed using HTML, CSS, and Bootstrap. Additionally, I was responsible for creating Spotify playlists corresponding to each mood and displaying them after the model analyzes users' emotion. For the next milestone, I will continue finishing off our front end design and help other teammates with the deployment process.