

Smart Banner Advertisement Using Dynamic Pricing

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Abstract:-

•Automatic age and gender classification has become relevant to an increasing amount of applications, particularly since the rise of social platforms and social media. Nevertheless, performance of existing methods on real-world images is still significantly lacking, especially when compared to the tremendous leaps in performance recently reported for the related task of face recognition.

•Also online advertising differs from traditional advertising channels in two important ways: measurability and targetability. Measurability is higher because the digital nature of online advertising means that responses to ads can be tracked relatively easily. Targetability is higher because data can be automatically tracked at an individual level, and it is relatively easy to show different people different ads.

•Here the model integrates the above two aspects of Automatic age and gender classification and online advertising to provide measures for efficient advertising keeping various aspects into consideration

Keywords— Smart Banner Advertisement, Age and Gender Prediction, Dynamic Pricing, Automatic advertisement rolling.

I. INTRODUCTION

The main aim of this model is to display the advertisement base on age and gender prediction.

The whole model is divided into following parts:

I. Front-End:

a. User interface:

- Getting advertisements and its preference from the user through web-site developed for user to keep track of the advertisement, update the advertisement and for doing analysis of the rolled advertisement.
- User can keep track of feed-back provided from the mongodb database server.

b. LED Display panel:

- At Led display panel a advertisement will be displayed on the basis of the result of prediction stored at online database server.

II. Back end:

a. Database entry from user side:

- ☑ Once user has uploaded his/her advertisement using user interface panel it will be stored online cloudinary database server created for the advertisement storage.
- ☑ A complete feed back analysis will be stored to mongodb database for each individual advertisements.

b. Predicting age and gender:

- ☑ Camera will be triggered at the certain interval time set by the admin and will detect the faces.
- ☑ From detected faces it will predict the age and gender by using deep learning model trained which has been trained using mobilenet trianed method by deep learning.
- ☑ Once age and gender has been predicted it will store the maximum count to the mongodb server.

c. Advertisement fetching:

- ☑ As mentioned above the prediction results will be stored in mongodb online database server through which related advertisement will be fetched and will be provided to LED panel for display.

II. FLOWCHART

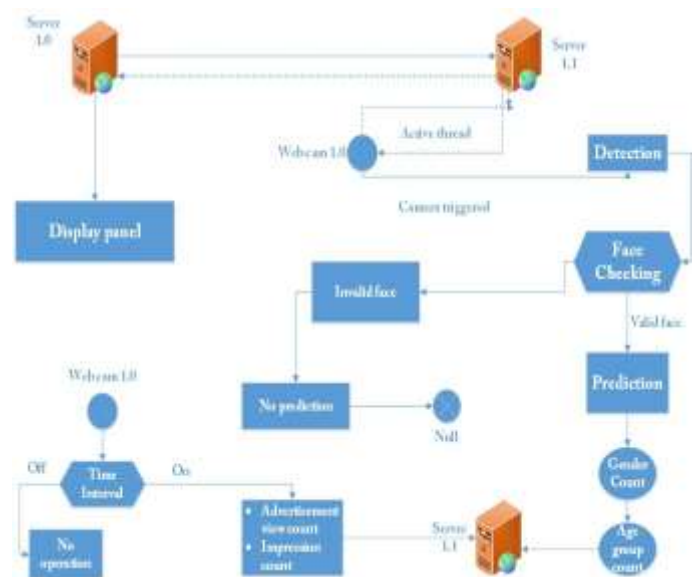


Fig 2.1 Flow chart

- a. Trigger the camera
 - i. Detect faces from the crowd
 - 1.If valid face has been found then predict age and gender, send the final result to the server for database entry.
 2. If no valid face has been found then perform no operation.
 - ii. Count view
 1. From detected face count the total number of users which are viewing the advertisement.
 2. From detected face count impressions (number of viewers who are watching whole advertisement)
 3. Send the final result of view and impressions to the database server.
- b. Fetch information from database server
 - i. Fetch final database entry of age and gender prediction for advertisement fetching.
 - ii. Fetch views and impression entry of the advertisements and send it to website at user interface.
- c. Fetch and display the advertisement
 - i. Base on the fetched result in b-i of age and gender fetch the advertisement from data storage to display it onto the LED panel.
 - ii. Display the views and impressions count of each advertisement at user interface.

III. WORKING

Working of the project is divided into following two categories:

I. Front-end

II. Back-end

I. Front-End

- a. LED Screen
 - i. Advertisement fetching and display the advertisement.
- b. User Interface
 - i. Upload new advertisement
 - ii. Feed-back analysis

II. Back-End

- i. Camera triggering
- ii. Face detection
 - a. Real face - Move to step iii
 - b. Partially detected face - Roll back
- iii. Live prediction
- iv. User feed-back (view and impression)
- v. Data trigger to the cloud
 - a. Trigger to cloud for advertisement fetching.
 - b. Send feedback to the user interface.
- vi. After Interval (step-i)
- vii. Follow steps i-vi

IV. GENDER PREDICTION

1. Face detection

To detect a face, Dlib Python Model has been used, which is trained with more than 8 lakhs images for better performance and accuracy.



Fig 4.1.1 Face Detection

2. Gender Prediction

- For gender prediction, mobile-net pretrained deep learning model has been used, which is again trained with more than 8 lakhs images for better performance and accuracy.

- Mobile-net pretrained deep learning model is provided by the google.

- To get the accurate result concept of hidden layers is used.

- For gender prediction the output of the hidden layer would be Boolean expression {(either 1 or 0) - (0 indicates male and 1 indicates female)}

Test case: 1

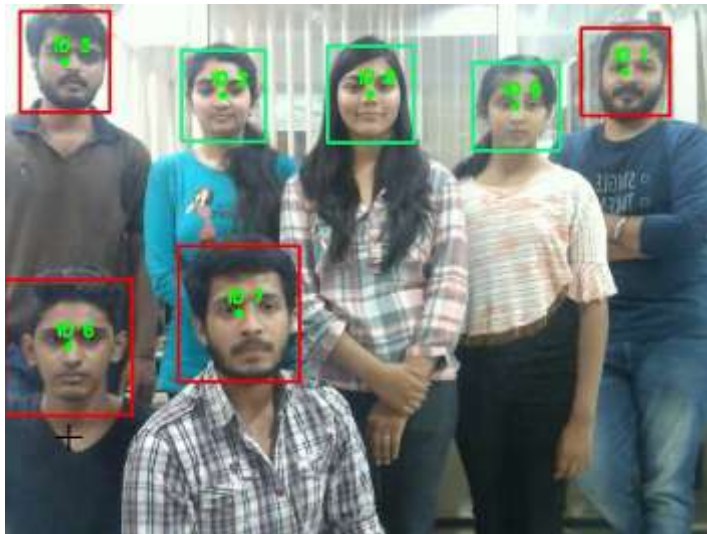


Fig 4.2.1 Gender Prediction

Here in above image red box indicates 0 output value of hidden layer while green boxes indicates 1 output value of hidden layer.

V. TEST CASES

No.	Male	Female	Index - age group
1	3	0	4 (21-25)
2	0	3	4 (21-25)
3	4	3	4 (24-25)

Table 5.1: Test Cases

Age group classification :

Index	Age group
0	0-3
1	4-7
2	8-14
3	15-20
4	21-25
5	26-33
6	34-40
7	41-48
8	49-59
9	60-100

Table 5.2: Age Groups



Fig 5.1 Age and Gender Prediction



Fig 5.2 Advertisement Display for test case 1

Test case: 2

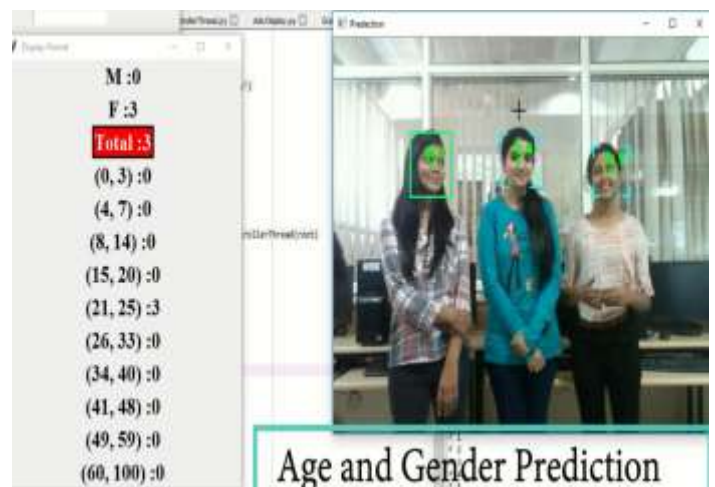


Fig 5.3 Age and Gender Prediction



Fig 5.4 Advertisement Display for test case 2

Test case: 3

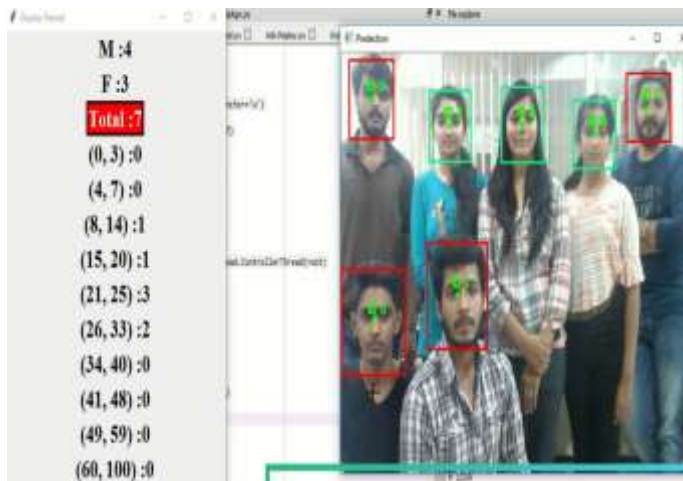


Fig 5.5 Age and Gender Prediction



Fig 5.6 Advertisement Display for test case 3

VI. SUMMARY

- Advantages of smart banner advertisement:
 - Advertisement will be displayed only to targeted audience hence the purpose to display advertisement would be fulfilled.
 - It will reduce the advertisement cost for the shopkeepers.
 - This system will increase the selling rate of the products.
 - As it will be displayed to targeted audience it would increase the selling rate of the product
 - No hard banner is required to display only a soft copy is required hence advertisement creation cost is reduced.

VII. CONCLUSION

It is a kind of model through which advertising can become smarter and dynamic, compare to static advertising and in term of cost dynamic advertisement will be much low, even feedback will be provided to client base on advertising rolls hence he/she can improve selling rate of the product.

VIII. REFERENCES

- [1] <http://eyalarubas.com/face-detection-and-recognition.html>
- [2] https://docs.opencv.org/2.4/modules/contrib/doc/face_cerc/facerec_tutorial.html
- [3] <https://medium.com/@ageitgey/machine-learning-is-fun-part-4-modern-face-recognition-with-deep-learning-c3cfc121d78>
- [4] <https://courses.learnopencv.com/p/computer-vision-for-faces>
- [5] <https://www.superdatascience.com/deep-learning/>
- [6] https://github.com/mzaradzki/neuralnets/tree/master/vgg_faces_keras
- [7] <https://keras.io/getting-started/sequential-model-guide/>
- [8] <https://www.spiedigitallibrary.org/journals/journal-of-electronic-imaging/volume-25/issue-06/061605/Automatic-age-and-gender-classification-using-supervised-appearance-model/10.1117/1.JEI.25.6.061605.full?SSO=1>
- [9] https://figshare.com/articles/Gender_Classification_Dataset/1000641

- [10] https://ijarcsse.com/docs/papers/Volume_7/5_May2017/SV715-0103.pdf
- [11] <https://jhui.github.io/2017/03/16/CNN-Convolutional-neural-network/>
- [12] <http://adventuresinmachinelearning.com/recurrent-neural-networks-lstm-tutorial-tensorflow/>
- [13] <https://www.pyimagesearch.com/2018/08/06/tracking-multiple-objects-with-opencv/>
- [14] <https://github.com/mahehu/TUT-live-age-estimator>