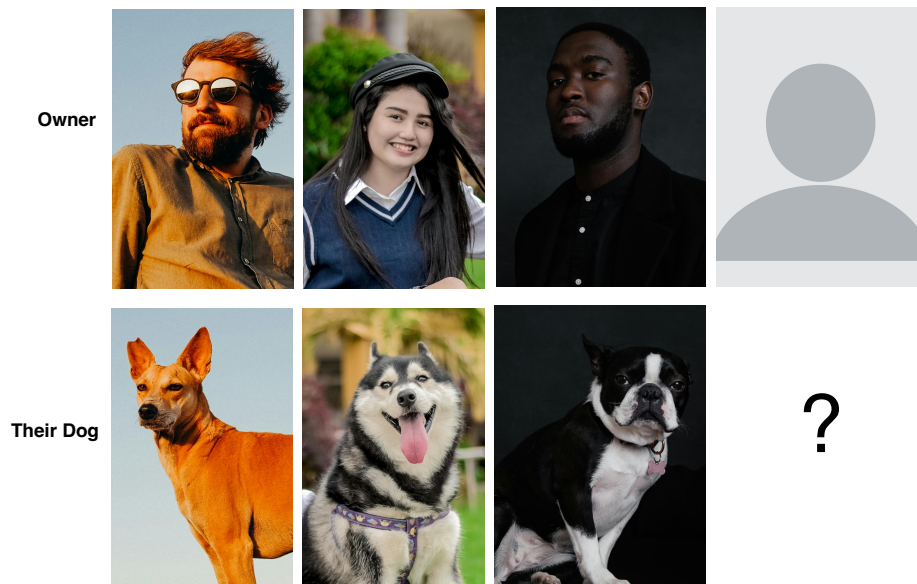


What is your dog likelihood?

Gemmechu Hassena, Simret Gebreegziabher, Bharath Hariharan

Abstract

10,000 years ago humans formed an unlikely companionship with gray wolves. Through time, these wolves changed and evolved to look like the adorable canine companions we keep as pets today. The notion that people consciously or subconsciously tend to pick canines that resemble them is a founded one. Research shows that similar to choosing a mate, people choose dogs that look more familiar to themselves without noticing it, and people look for similar physical features and personality resemblances in their pets. We analyze this similarity using the facial recognition models from computer vision. We train and evaluate a model that can predict dog likelihood given picture of a human face.



1 Introduction

Previous studies have debated whether humans pick dogs that resemble them. The notion that people consciously or subconsciously tend to pick canines that resemble them is a founded one. Research shows that similar to choosing

a mate [2], people choose dogs that look close to their own feature with factors like hairstyle and breed influencing their choices [1]. Furthermore, [3] finds that dog owners may choose their pets to display their gender identities.

Consider Figure 1: you see a human standing with two breeds of dogs. Which breed of dog do you think is the actual dog of the human in question? If you guessed the image on the right, then you are correct. The resemblance between the dog and the owner is uncanny. There is a lot of research that has been done in regard to whether people choose dogs who look like them or give their dogs major makeovers to make them look like them in time. We will leave this question to be answered by people who know dogs and psychology, but we know computer vision and we want to train computers to identify which dog belongs to which human. Why, you ask? Cause why not?



Figure 1: A ‘real’ human standing with a ‘not-so-real’ dog.

To achieve this we collected 1500 images of dogs matched with their owners. Then we trained a model of facial resemblance between a dog and its owner using FaceNet [4] Architecture with ResNet50 backbone. After training the network we decided to give it a go and asked our friends to send us pictures of their dogs. Our model has 70% accuracy.

2 Methodology

2.1 Preprocessing

After collecting 1500 images of dogs and their owners, the first thing we did was to separate the human and the dog images. By running an object recognition model, we predict and create a bounding box on dogs and the person from which we extracted the dog and person.

2.2 Training

Once we had the dataset ready we trained a FaceNet model. At the time we trained the model, FaceNet was the state-of-the-art for facial recognition problems. We fine-tuned a pre-trained model using our customized dataset. We propose dog-likelihood, a loss function inspired by the Triplet loss function to train the model. Triplet loss is a loss function for machine learning algorithms where an anchor input is compared to a positive input and a negative input. The distance from the anchor input to the positive input is minimized, and the distance from the baseline input to the negative input is maximized. Dog-likelihood minimizes the distance between the owner and their dog, and maximizes the distance between the human and all other dogs.

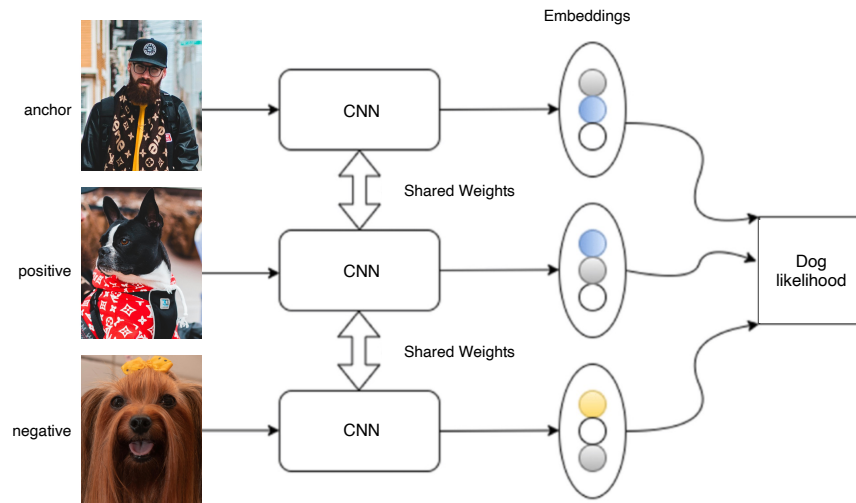


Figure 2: Dog-likelihood loss function

2.3 Results

We used real humans to test our system on real data performs 70% to be correct As shown on Figure 3 but with more data and training this number will only get better.

4 Conclusions

Humans consciously or subconsciously pick their companions, be it humans or dogs, that resemble them better. In line with this hypothesis, in our experiment we tried to show that we can create an AI model that matches dogs and owners solely based on their physical appearance. Although we were able to predict 70% of the queries correctly, we can not conclude that this theory will always hold true. But next time you are in the park and you see someone with their dog, we encourage you to try and see the resemblance between the two without making too much eye contact with the human.

5 Disclaimer

If this paper does not get accepted we know that the reviewers are cat people. Reviewer 2 (secretly a cat): This paper has limited novelty, you should use diffusion instead MEOW MEOW

References

- [1] Stanley Coren. Do people look like their dogs? *Anthrozoös*, 12(2):111–114, 1999.
- [2] Ferenc Kocsor, Rita Rezneki, Szabolcs Juhász, and Tamás Bereczkei. Preference for facial self-resemblance and attractiveness in human mate choice. *Archives of sexual behavior*, 40:1263–1270, 2011.
- [3] Michael Ramirez. “my dog’s just like me”: dog ownership as a gender display. *Symbolic Interaction*, 29(3):373–391, 2006.
- [4] Florian Schroff, Dmitry Kalenichenko, and James Philbin. Facenet: A unified embedding for face recognition and clustering. *Proceedings of the IEEE conference on computer vision and pattern recognition*, pages 815–823, 2015.