How Dogs (Both AI generated and real) can help train AI models to spot deep fakes.
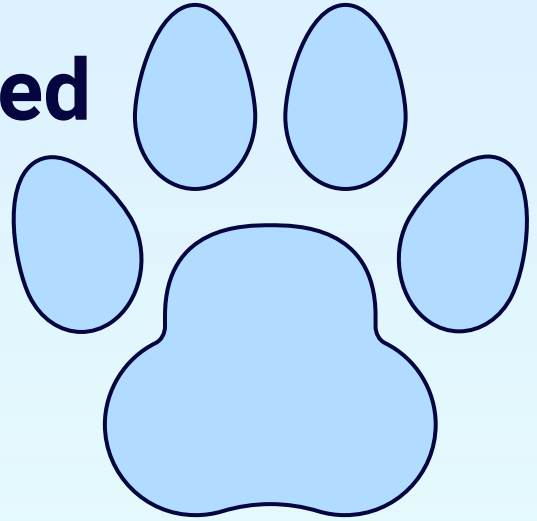
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Research Question

Can we train AI to recognize the difference between an AI generated image and a real one?

Background Information

I want to investigate the possibility of an AI model being able to recognize an AI generated image of a Yellow Labrador, and an image of a real Yellow Labrador; the main reason I wanted to do this was to consider the possibility of a similar technology being used to spot deep fakes, an issue that plagues social media and other platforms. So before you see the rest of this project, what is a deep fake?

Deep Fakes are synthetic media that have been digitally manipulated to replace one person's likeness convincingly with that of another. It can also refer to computer-generated images of human subjects that do not exist in real life.

Hypothesis

The machine learning model trained using Teachable Machine should be able to accurately differentiate between AI-generated images of dogs and real images of dogs with a high degree of accuracy.
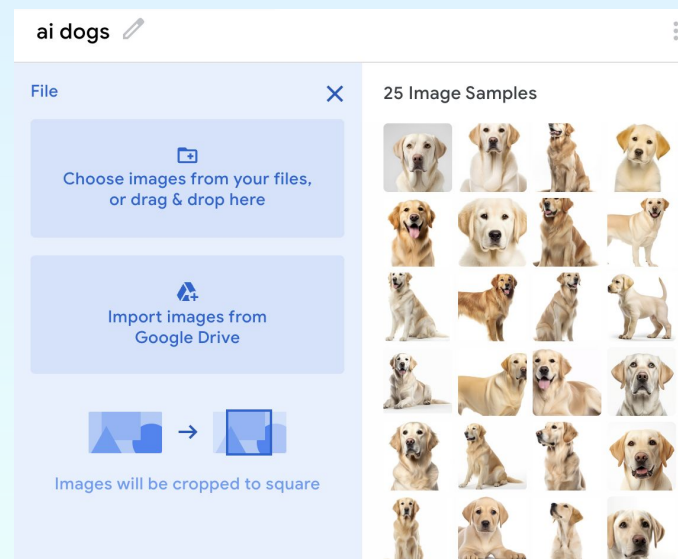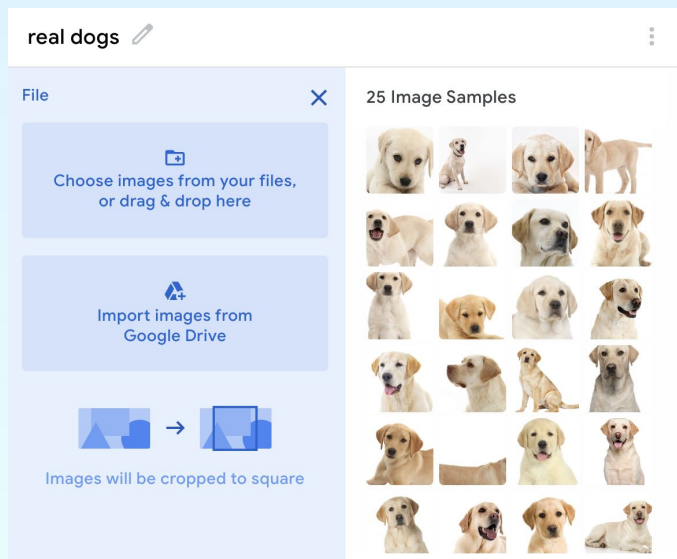
Materials

- Computer with internet access
- Teachable Machine software (https://teachablemachine.withgoogle.com/)
- Dataset of real images of dogs (25 images)
- Dataset of AI-generated images of dogs (25 images)

Procedure

1. Collect a dataset of real images of dogs. This dataset should include the same dog breed, poses, and backgrounds to ensure a diverse training set.
2. Collect a dataset of AI-generated images of dogs. These can be generated using various AI art generators available online.
3. Open Teachable Machine on your computer and select the "image project" option.
4. Import the dataset of real images of dogs and label them as "real dogs."
5. Import the dataset of AI-generated images of dogs and label them as "AI dogs."
6. Train the machine learning model using the images of real dogs and AI-generated dogs. Follow the instructions provided by Teachable Machine to train the model effectively.
7. Test the model using 10 new images of dogs that were not included in the training set. This will help determine the accuracy of the model in differentiating between real and AI-generated images of dogs.
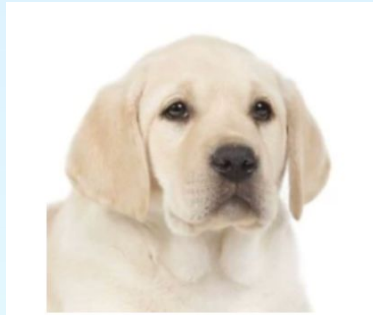8. Evaluate the performance of the trained model using accuracy.
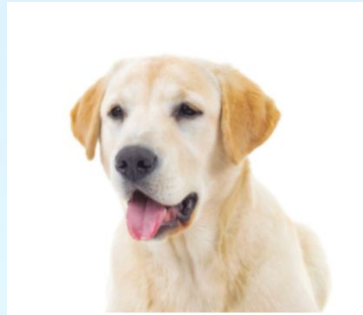
Procedure (cont.)

real dogs

File   ✕

Choose images from your files, or drag & drop here

Import images from Google Drive

Images will be cropped to square

25 Image Samples

ai dogs

File   ✕

Choose images from your files, or drag & drop here

Import images from Google Drive

Images will be cropped to square

25 Image Samples

Results
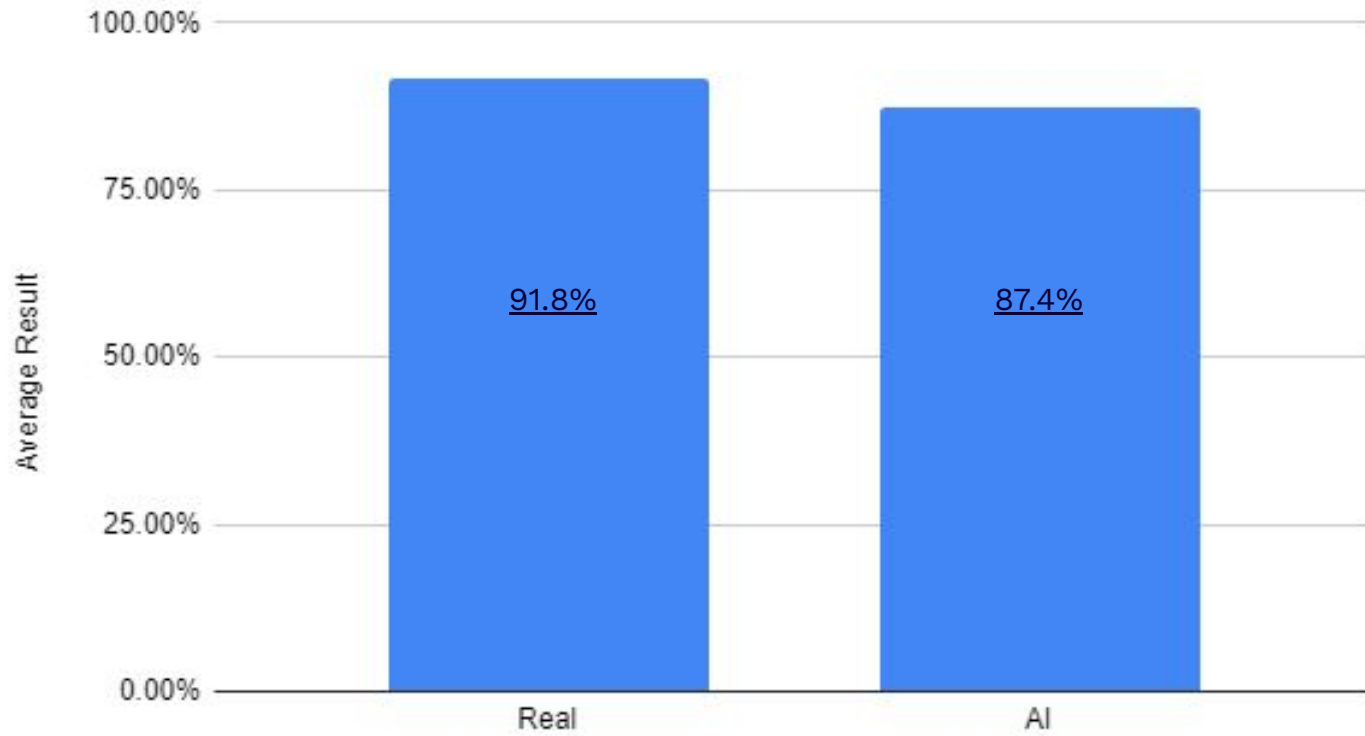
Real   AI

I used 5 of each kind and recorded the
amounts in my table, but only included
a few in the slide.

trial	AI or Real	Result
1	Real	94% Real
2	Real	69% Real
3	Real	100% Real
4	Real	98% Real
5	Real	100% Real
6	AI	100% AI
7	AI	99% AI
8	AI	79% AI
9	AI	63% AI
10	AI	100% AI

Average Result of Ai vs Real in Percentage

Future Work

In the near future, I am looking forward to delving into further research by conducting a similar experiment using a more extensive sample size specifically focused on human facial recognition. By increasing the sample size, I hope to gather more comprehensive data and draw more robust conclusions on AI processes related to facial recognition. This expanded study will provide a deeper understanding of how AI perceives and interprets facial features.