

Scenario

There are many situations where it is essential to be able to quickly and accurately analyze an image. Doctors need to be able to detect the first signs of cancer in a medical scan to start treatment as soon as possible. Conservationists need to be able to recognize early indicators of deforestation in satellite images to be able to respond quickly. Machine learning is a powerful tool that can aid in this type of image identification.

Machine learning is a subset of artificial intelligence that involves programming and training computer models using large sets of data. For image recognition, these models are trained using large sets of images. During the training stage, the model identifies patterns in the images and uses those patterns to classify them. The model is then tested on new images and refined to improve its accuracy. It is important to include as much variation as possible in the image data sets to reduce bias during this process. For example, a machine model that is only trained on male medical scans would be less accurate when analyzing female medical scans. While it is impossible to remove all bias, it can be reduced with careful training and awareness of potential blindspots.

Machine learning is more accessible than ever and entrepreneurs are harnessing it in new and innovative ways. But machine learning and image identification carry significant ethical implications, from automating bias to invading privacy. In this challenge, you will need to design a business that creatively uses machine learning, while acknowledging and addressing its negative implications.

Challenge Statement

Your challenge is to design a business that uses machine learning for image identification. Your solution should:

1. **Include a machine learning model.** Describe how your product or service uses machine learning models for image identification.
2. **Prototype your model.** Use the Teachable Machine to build a prototype of the type of machine learning model that your business will use.
3. **Report effectiveness.** Document the success of your machine learning model across multiple training sessions. This should include a log documenting:
 - a. The probability of your program correctly identifying an image after each training;
 - b. Conditional probabilities of correctly identifying different subcategories of images after each training;
 - c. A plan for how to improve the conditional probabilities by retraining your model.

Use the Machine Learning Training Log to document the performance of your machine learning model.