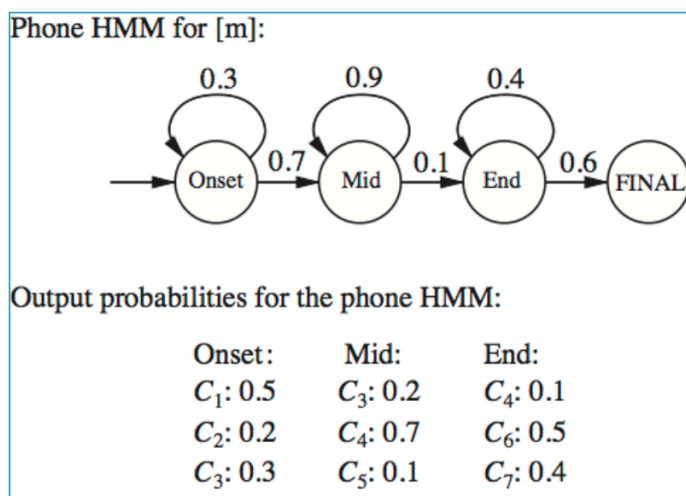


1. Hidden Markov Model:

Given a sequence: C_1, C_2, C_4, C_4, C_6



a. Onset, Onset, Mid, Mid, End

$$(0.5) * [(0.3) * (0.2)] * [(0.7) * (0.7)] * [(0.9) * (0.7)] * [(0.1) * (0.5)] * (0.6) = 2.778 \times 10^{-4}$$

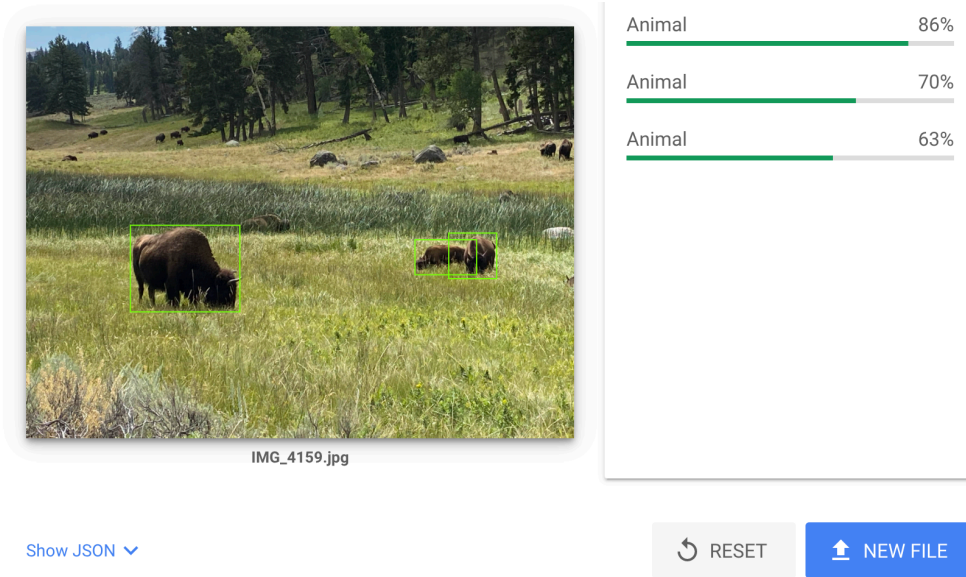
b. Onset, Onset, Mid, End, End

$$(0.5) * [(0.3) * (0.2)] * [(0.7) * (0.7)] * [(0.1) * (0.1)] * [(0.4) * (0.5)] * (0.6) = 1.764 \times 10^{-5}$$

As a result, 'a' has the highest probability, so it is the most likely explanation of features.

2. Picture identification(Google):

The picture is taken in Yellowstone national park and animals in it are bisons.



The screenshot shows a Google Image Search interface. On the left is a photo of a grassy field with several bisons. Two bisons in the foreground are highlighted with green bounding boxes. Below the photo is the filename "IMG_4159.jpg". To the right of the photo is a list of search results, each showing the word "Animal" followed by a green progress bar and a percentage: 86%, 70%, and 63%. Below the photo is a link "Show JSON" with a dropdown arrow. At the bottom right are two buttons: "RESET" with a circular arrow icon and "NEW FILE" with an upload icon.

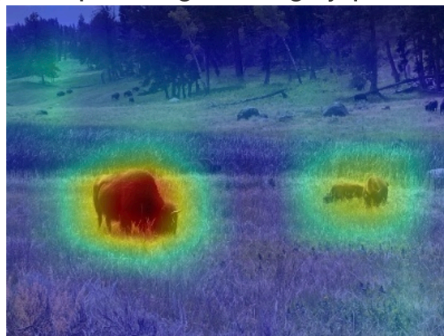
Search Result	Percentage
Animal	86%
Animal	70%
Animal	63%

It identified three nearest bisons successfully, but there were more animals far away that were not recognized.

3. Picture identification(MIT):

Predictions:

- **Type of environment:** outdoor
- **Scene categories:** pasture (0.365), hayfield (0.243), field/wild (0.177), farm (0.136)
- **Scene attributes:** open area, natural, natural light, vegetation, camping, grass, sunny, foliage, hiking
- **Informative region for predicting the category "pasture" is:**



All attributes and the predicting category are correct! However, so far, neither Google nor MIT picture identification are able to recognize bisons.

4. Artificial intelligence ethical issues:

In the video the professor played in the class, it used visual technology to replace the face of the actor, which has brought many conveniences to human beings. For example, in the famous movie Furious 7, since one of the actor died in a car accident, the director asked his brother to shoot the remaining shots. Later, this technology was used to copy the actor's face to his brother's face, so that the movie was completed and released smoothly. However, under the same technology, people can also use it to do bad things. For instance, people use this technology on inappropriate films, which causes trouble in other people's lives. Therefore, the ethical of users is very important, because their purpose will affect whether the technology brings advantages or disadvantages. First, users must confirm that their purpose does not harm others. Furthermore, the use of other people's portraits must obtain their consent. In this way, we can be sure that the technology will not be used in inappropriate places.