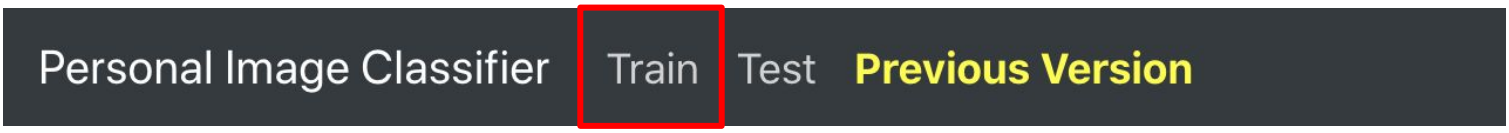
PICaboo Part 1: Training the Model

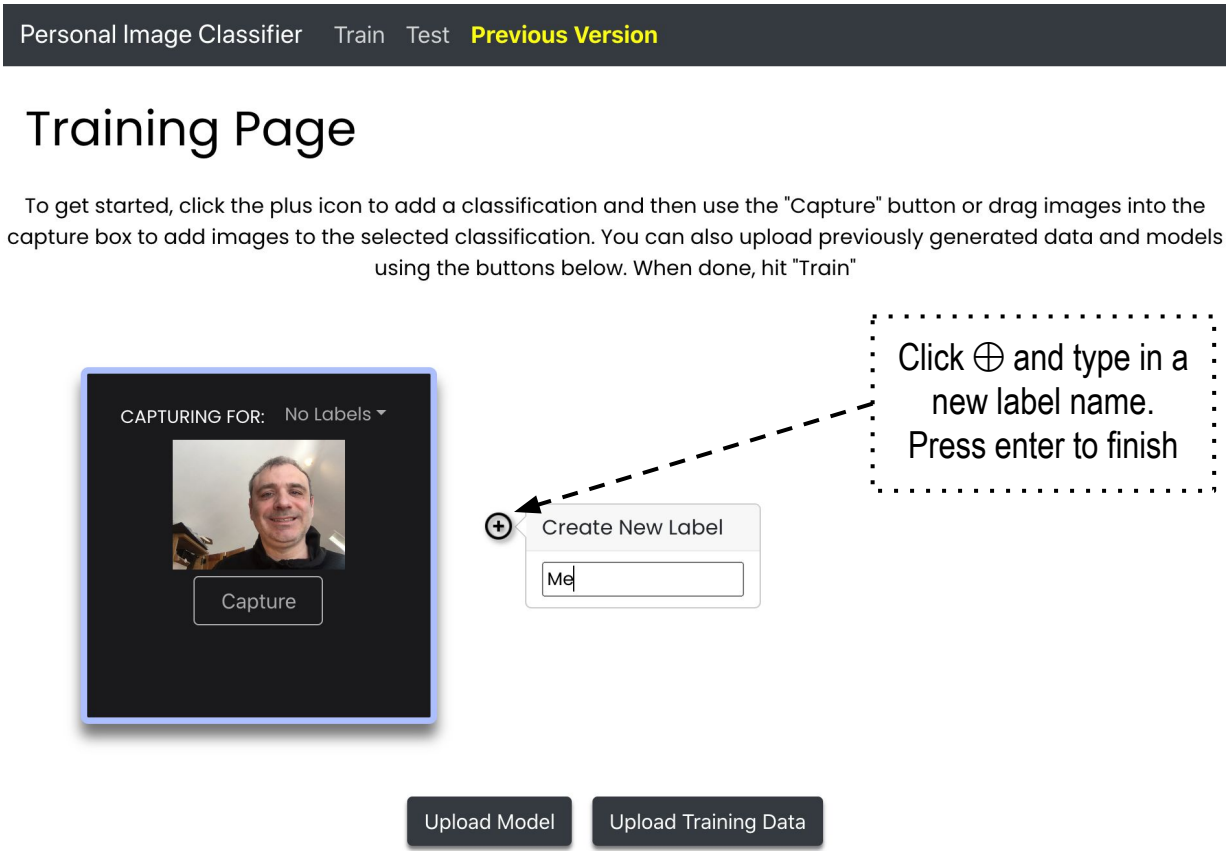
- Open your browser and go to the Personal Image Classifier (PIC) https://classifier.appinventor.mit.edu

In this part, you will train your own personal image classification (PIC) model to recognize you showing or hiding your face so that you can play the game Peekaboo on your mobile device.



CREATE LABELS FOR IMAGE CLASSES

- First, add two facial exposure classes (showing your face and hiding your face) for the model to learn using the add labels box. Even though in this project we will create a model with only two classes, in general you can add as many as you like. Call the first class **Me** – corresponding to you showing your face. (Pay attention to capitalization!)



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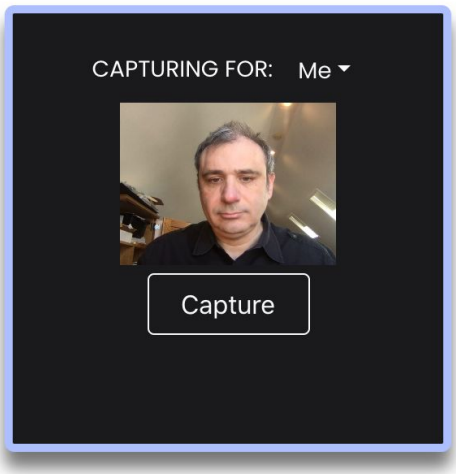
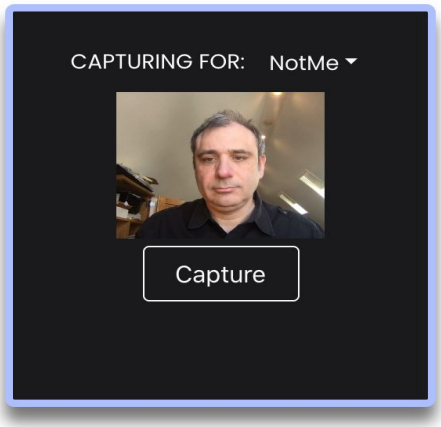
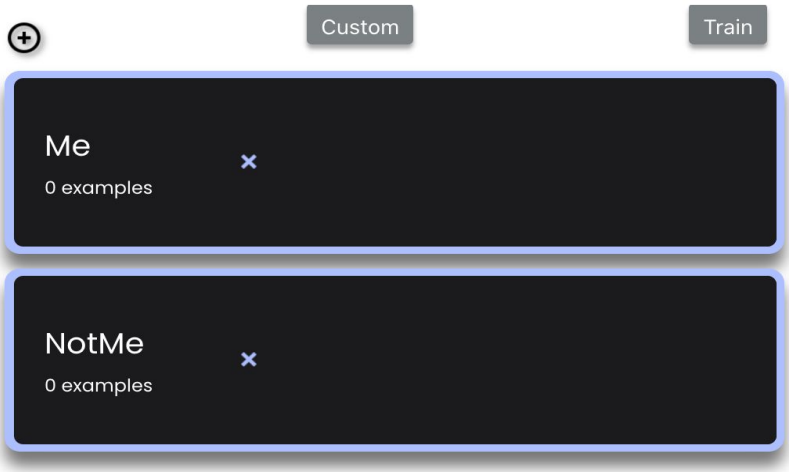
- Then create the second class **NotMe** (no space between “Not” and “Me” and pay attention to capitalizations), corresponding to you hiding your face.



- You should now have two classes – **Me** and **NotMe** as shown below. For the rest of this project it is important that your two classes are named exactly as shown.





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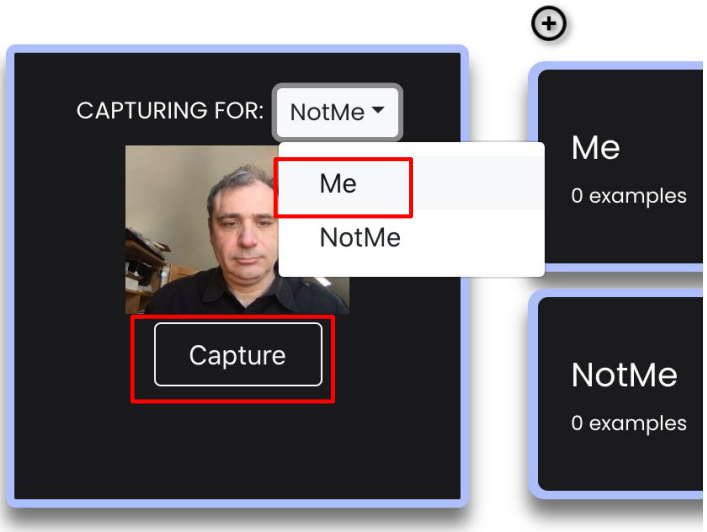
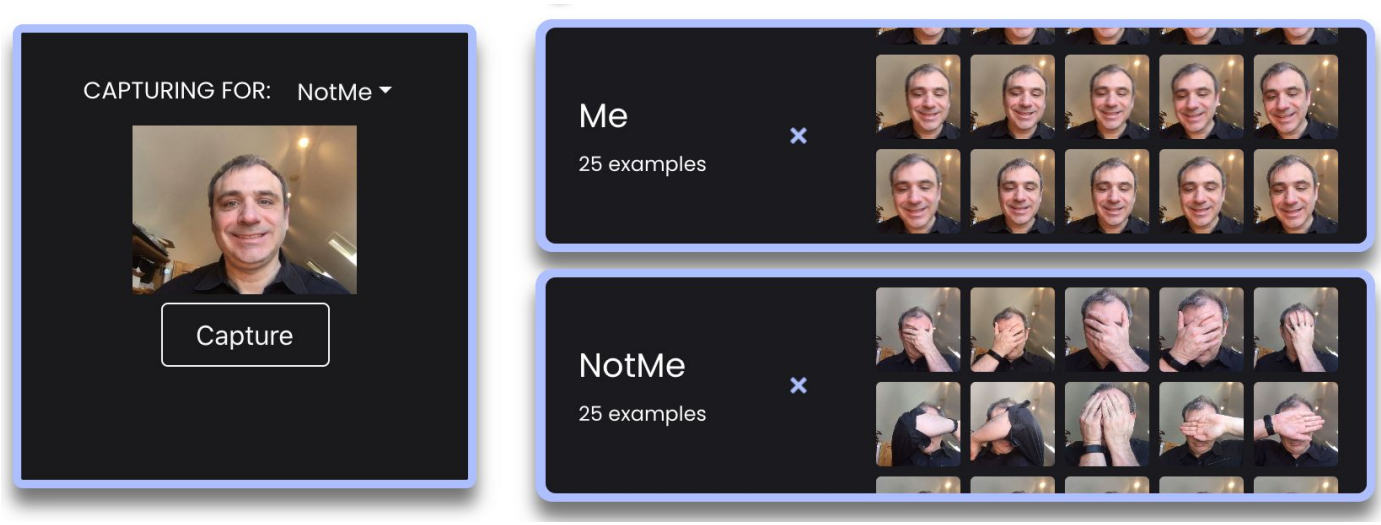
ADD EXAMPLES

- ❏ Select one of your classes from the dropdown menu, pose in front of the webcam, and click “Capture” to add an image to that class for your model to learn from. You should take about 25-50 images for each of your two classes.



- ❏ For the **Me** class, capture many poses of your fully shown face from many different angles and sides. For the **NotMe** class, capture many poses of your face hidden by your hand. Be sure to use different hands in your poses. You may need to open your fingers a crack when covering your face to see what you are doing. You should get something like below:



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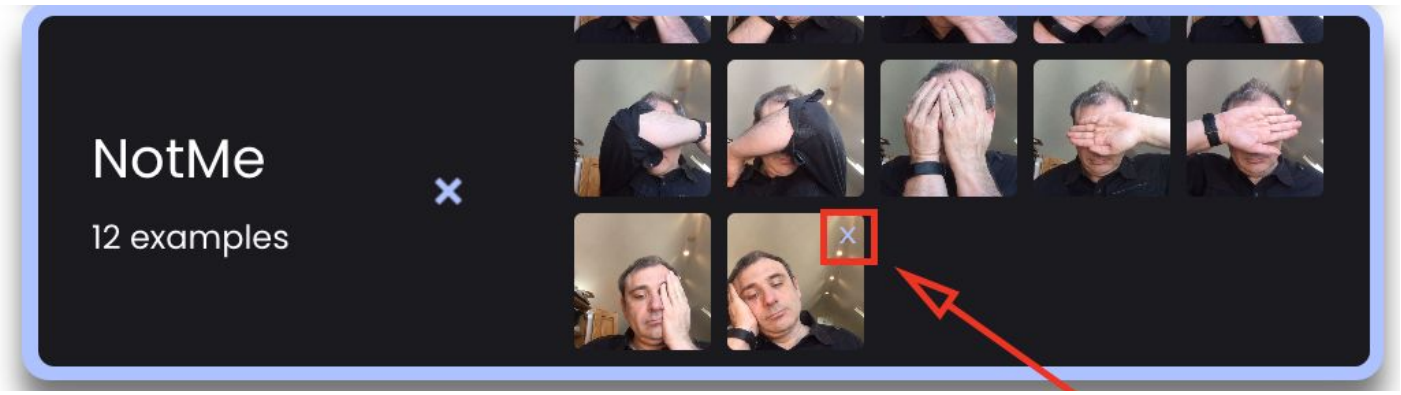
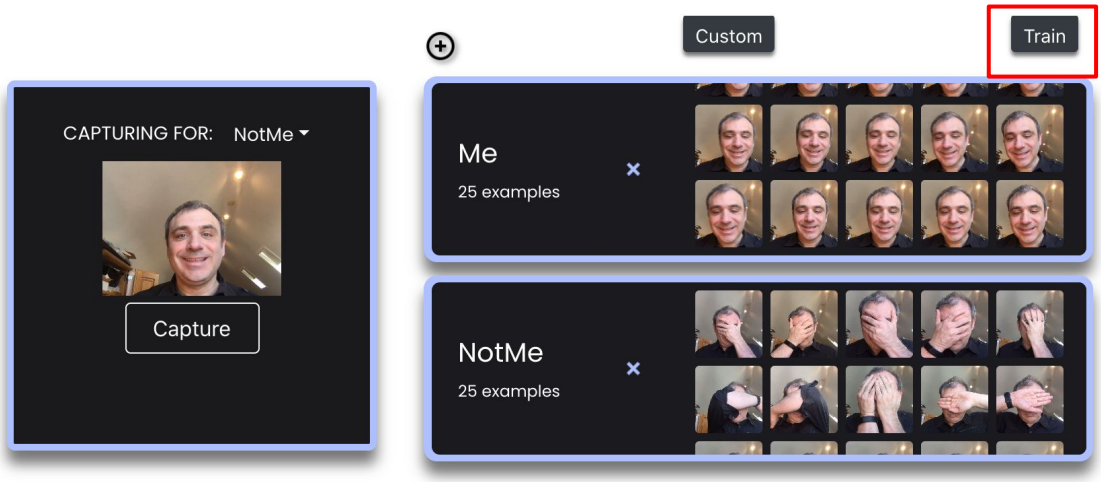
- You can delete any images that you don't want to include by clicking on the "x" in the upper right corner of the thumbnail.



- When you have finished adding examples for your two classes, click on the Train button at the top right to move onto the next step.



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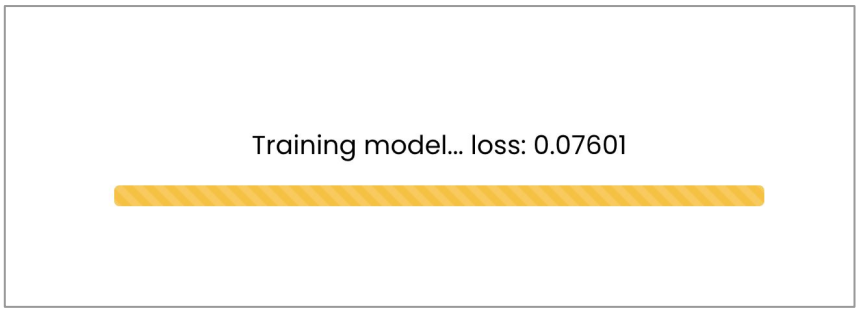
TRAIN THE MODEL

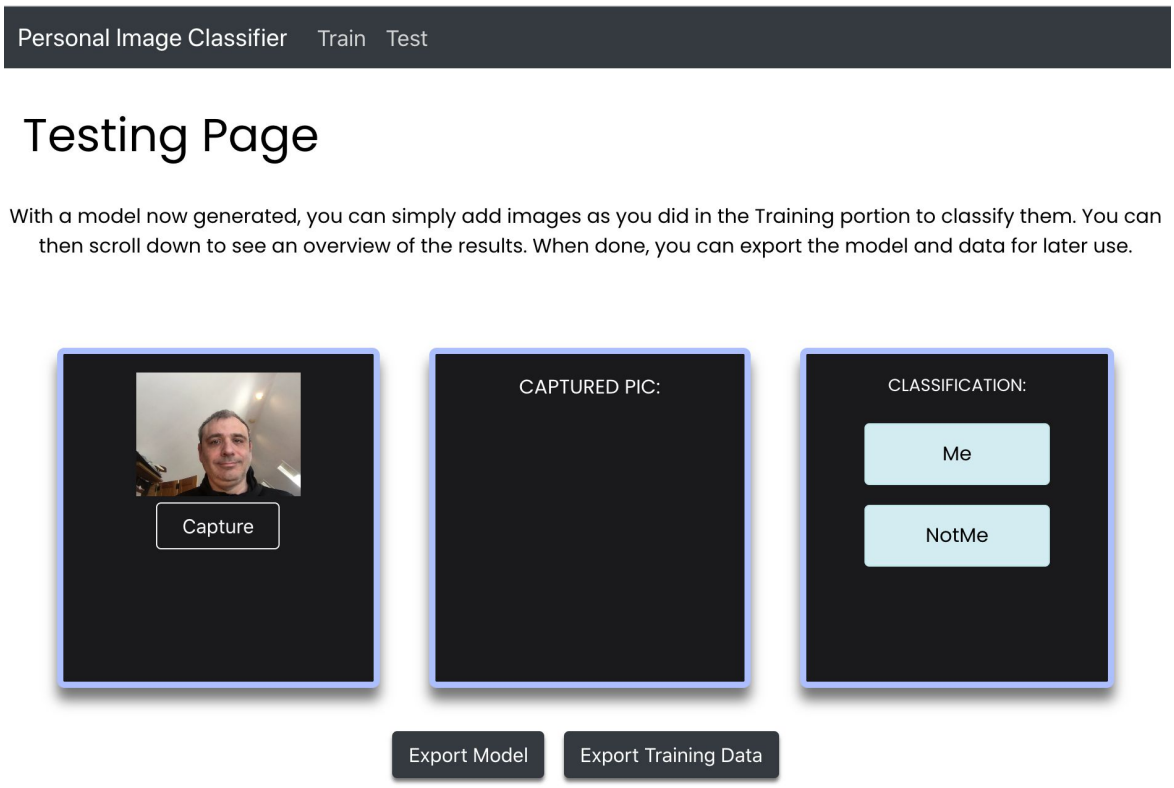
- ❏ After clicking “Train Model” watch as some basic information about the training process is displayed.



Loss measures how well the model is performing on the images you gave it. The number decreases as the model is trained.

- ❏ When the training is finished, you will automatically be moved to the testing step.

If training is taking a long time or slows down your browser, try starting over with fewer training examples. **Just click “Train” at the top to return to that page.**



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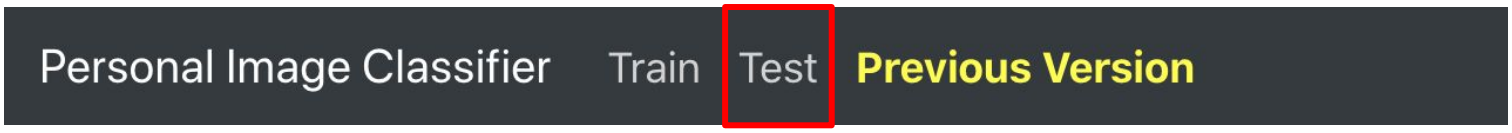
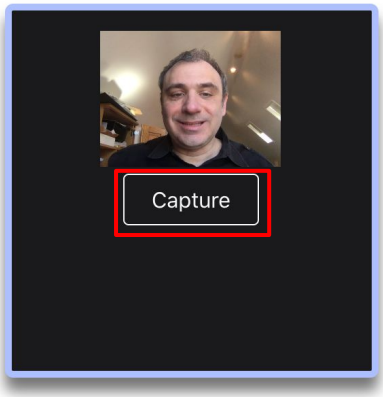
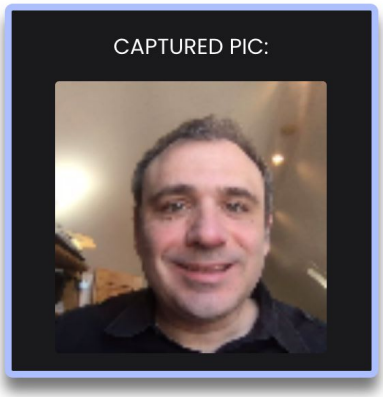
TEST THE MODEL

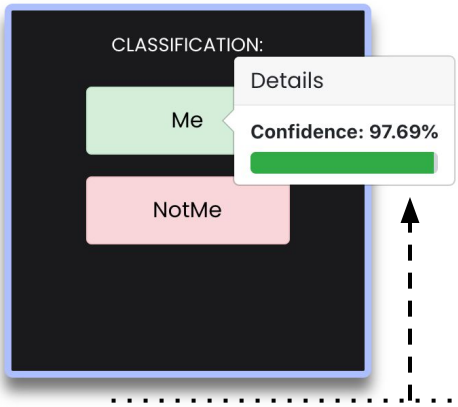
This step lets you try additional examples to test your model. This allows you to see how well your model performs on images it has not seen before.



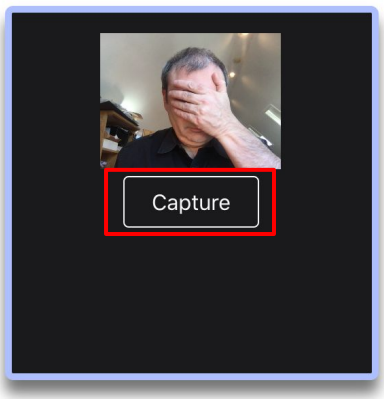
- Adding examples in testing works in a similar way to training. Use the webcam and click the “Capture” button to test an image. You will see the result to the right in the Classification window. The classification is shown in green.

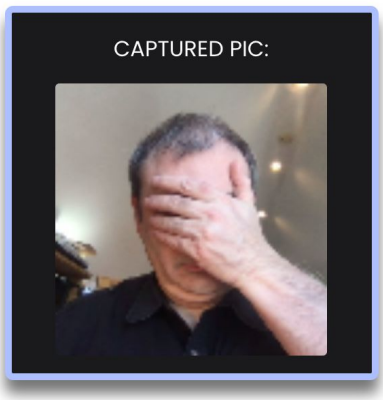


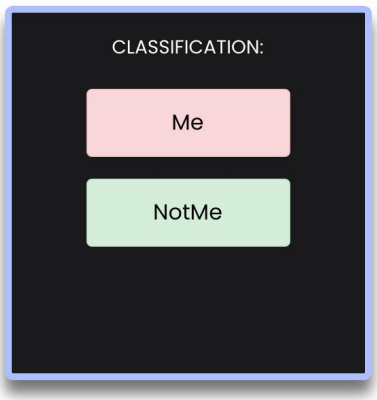




Hover over any of the labels to see what the confidence level is. The higher the confidence percent, the better.







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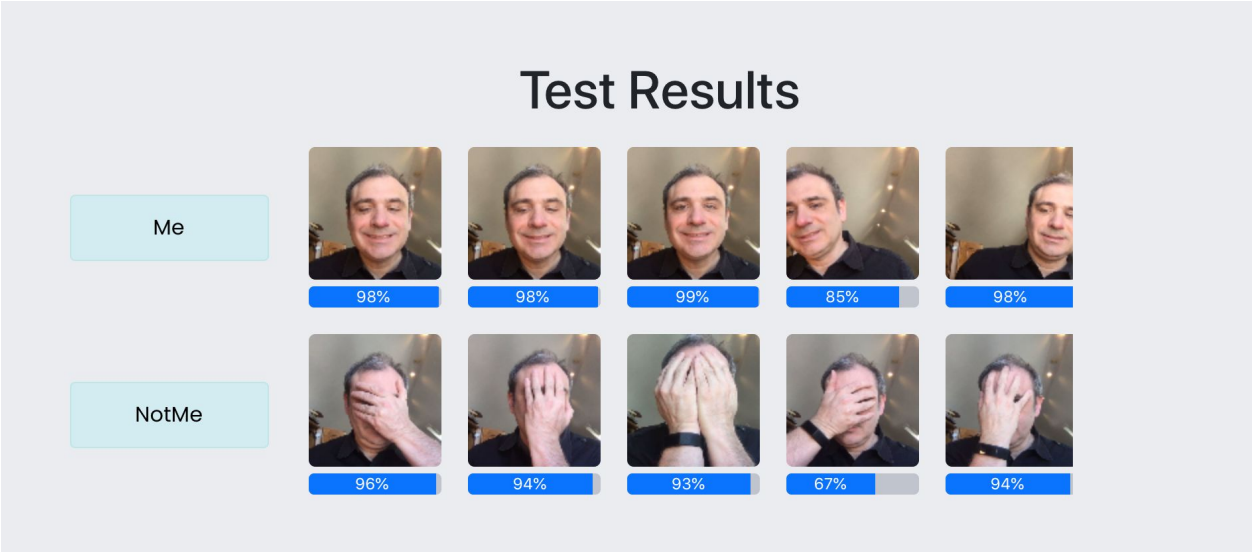
VIEW RESULTS

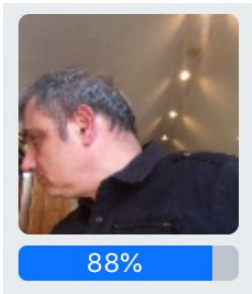
The Test page shows your results when you scroll to the bottom of the page.

- ❏ Scroll through the individual results for each label.

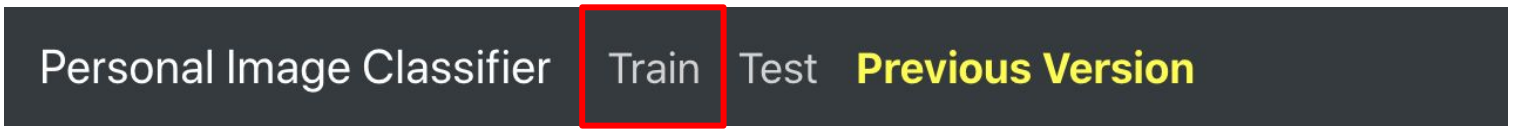


- ❏ Most likely, some of your testing images will be classified incorrectly.

In this example, the classifier classified this image as most likely to be **NotMe** with 88% confidence. It could be due to the change in background or the position of the face.



- ❏ If you are not satisfied with the number of correct classifications, you can go back to the Training page to add more examples or start over. Just click on Train at the top of the screen to return to that page.



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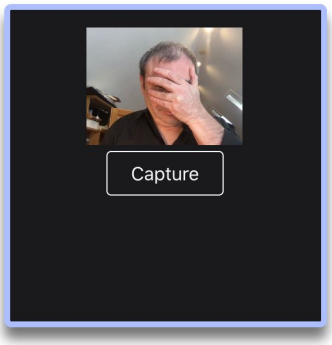
REPEAT STEPS FOR A BETTER MODEL

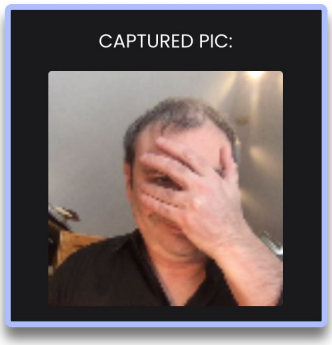
- ❑ Repeat the steps – add more examples, train the model, add test images, and view the results until you are satisfied

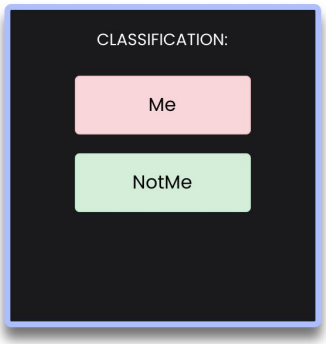
- ❑ Here are some things to try when you repeat steps.

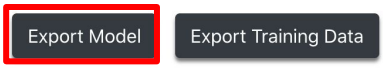
1. Check the images that are classified incorrectly.
   a. Why do you think the computer classified these images incorrectly?
   b. Try to improve the model to predict correctly. Go back to the training page and add more training images to try to address the poor prediction.
2. Try testing images in different conditions.
   a. Move your face close or farther away from the camera
   b. Move your face into different parts of the screen
   c. Use a different background behind you.
   d. Observe what happens to the predictions.
   e. See if you can intentionally trick the model into making a wrong prediction.
   f. Retrain the model as needed to address these various conditions.

- ❑ When you are satisfied with your model (or when time is up), click the "Export Model" button on the bottom left. Save the model file on your computer to be used in Part 2.









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EXPORT TRAINING DATA

Now that you've constructed a model, you'll be able to make apps that use the model.

- ❏ You might decide later to add more examples to retrain your current model, so export the training data too, and save it on your computer. This zip file will contain all your training images for your model. You might need this file if you decide to access your training examples later in this project.