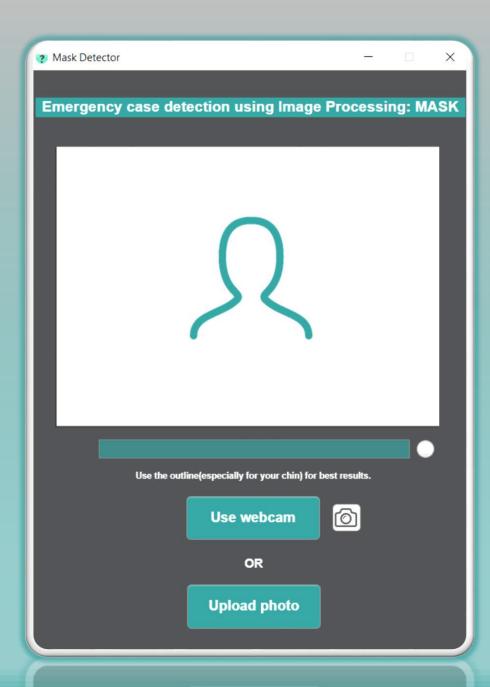
Emergency Case Detection: MASK



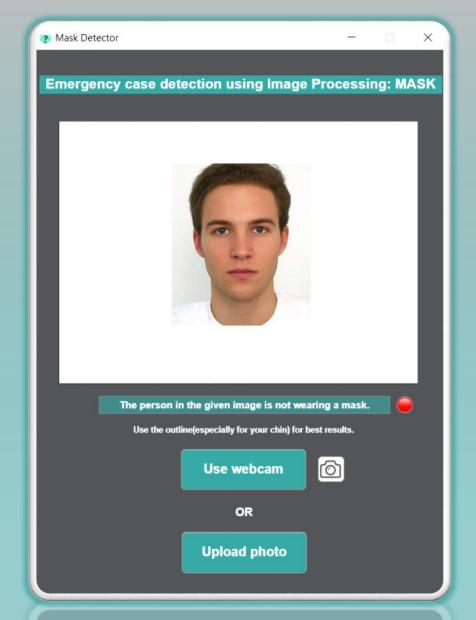
Creating a Mask Detector app using image processing technique.

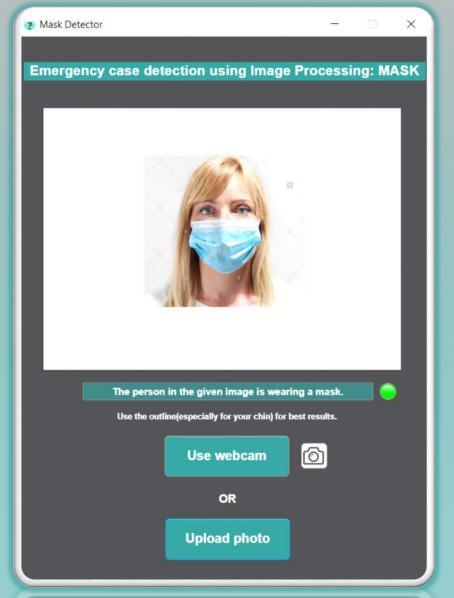
Mehmet Anıl Şen 090200322

Preview: the start screen



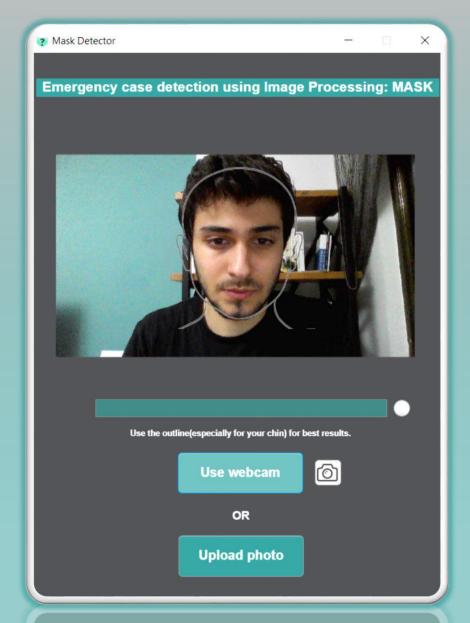
Preview: upload option

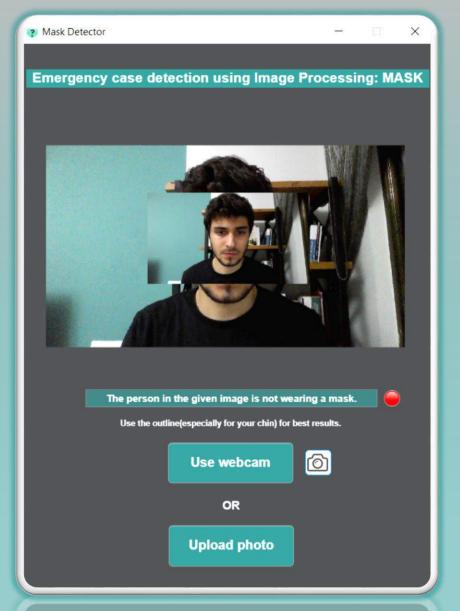




the upload option lets the user upload desired image from any folder.

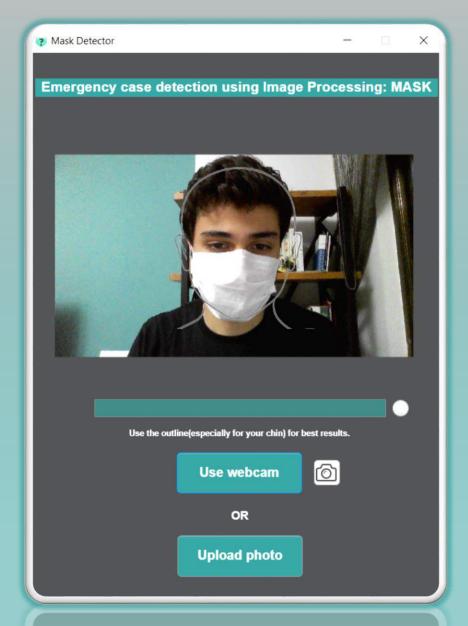
Preview: webcam option

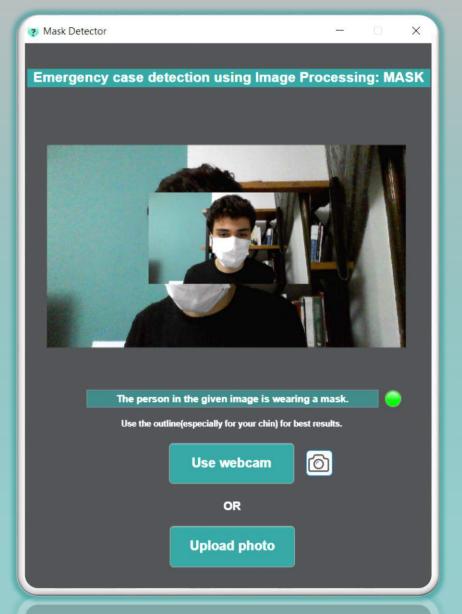




using the outline properly will result in better accuracy.

Preview: webcam option





using the outline properly will result in better accuracy.

How?:

database, re-shaping & computing the avarage

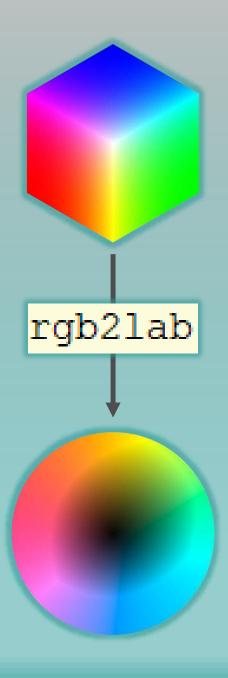
I firstly started to create a photo-database of people wearing masks in various colors and the ones without masks. Following this, I cropped all with a similar shape. Afterwards, I wrote a matlab program that assigns an image variable(uint8) that only includes the person's mouth chin and cheek then computes the variable's R G B values' avarage so that I can get an exact avarage color for the given photo. After applying these calculations for each photo of each color of mask, I got myself a colorpalette of people wearing masks in various colors.



How?:

comparing two colors on visual similarity

With the color palette I managed to create, I could scan a photo on mask existance by applying the same cropping technique and computing the avarage to compare it with the colors on the color palette. Well, but comparing colors on visual similarity with RGB color model isn't a good choice since it is not perceptually uniform. So I decided to use L*a*b*(CIELAB Color Space) which is intended to be a perceptaully uniform colorspace.



How?:

final code & DeltaE

After converting RGB to L*a*b* I can now tell the similarity between two colors by computing the DeltaE (the measure of change in visual perception of two given colors). Following this, I coded the final program that would print that the person is wearing a mask if the given photo's avarage color is more similar to a color than unmasked's and would print that the person is not wearing a mask if avarage color is more similar to unmasked's than any other color on the color palette.

```
%% comparison with black
   avgblacklab=rgb2lab(avgblack);
   DeltaE(1)=sqrt(sum((avgblacklab-wantedavglab).^2));
    %% comparison with blue
   DeltaE(2)=sqrt(sum((avgblacklab-wantedavglab).^2));
   %% comparison with green
   avgblacklab=rgb2lab(avggreen);
   DeltaE(3)=sqrt(sum((avgblacklab-wantedavglab).^2));
    %% comparison with white
    avgblacklab=rgb2lab(avgwhite);
    DeltaE(4)=sqrt(sum((avgblacklab-wantedavglab).^2));
    %% comparison with neutral
    avgblacklab=rgb2lab(avgneutral);
   DeltaE(5)=sqrt(sum((avgblacklab-wantedavglab).^2));
 i=find(DeltaE==min(DeltaE));
tprintf('DeltaB values for given image %s is: \n',q(k).name);
  fprintf('The person in the given image %s is not wearing a mask.\n',q(k).name);
  fprintf('The person in the given image %s is Wearing a mask.\n',q(k).name);
 fprintf('The person in the given image as is wearing a mask.\n',q(k).name);
  sprintf('the person in the given image %s is not wearing a mask.\n',q(k).name);
sprintf('DeltaE values for given image is is: \n', q(k).name);
avguident (avgblacklab-wantedavglab) - 2)) - DeltaE(5) = Sqit(Sum((avgblacklab-wantedavglab) - 2)) - Sqit
```

Conclusion: testing the accuracy & end of the project

I tested the accuracy of my program with almost 80 photos including photos of my family members, my friends and me with mask and without. The program was inaccurate for 3 of the photos which were the ones that poorly shot but was fully accurate for the rest of the data. That means a %96.25 accuracy. To make things easier for the user, I designed an app using MATLAB App designer.

```
The person in the given image m2.jpg is wearing a mask.
                                                                                                  The person in the given image m3.jpg is Wearing a mask.

The person in the given image m4.

The person in the given image m4.
                                                                                                  The person in the given image m4.jpg is wearing a mask.
                                                                                                  The person in the given image m5.jpg is wearing a mask.
                                                                                                  The person in the given image m6.jpg is wearing a mask.
                                                                                                  The person in the given image m7.jpg is wearing a mask.
              in the given image n10.jpg is not wearing a mask.
                             wen image nll.jpg is wearing a mask.
                                                                                                  The person in the given image m8.jpg is wearing a mask.
                                  image n12.jpg is not wearing a mask.
                                                                                                   The person in the given image m9.jpg is wearing a mask.
                        given image nie.jpg is not wearing a mask.
        erson in the given image ni8.jpg is not wearing a mask.
                                                                                                 The person in the given image y1.jpg is wearing a mask.
   he person in the given image n19 png is not wearing a mask.
                                                                                                The person in the given image y2.jpg is wearing a mask.
   We person in the given image n2.jpg is not wearing a mask.
  the person in the given image n20.jpg is not wearing a mask.
                                                                                                The person in the given image y3.jpg is wearing a mask.
  the person in the given image n21.jpg is not wearing a mask.
   we person in the given image n22.jpg is not wearing a mask.
                                                                                                 The person in the given image y4.jpg is wearing a mask.
   he person in the given image n23.jpg is not wearing a mask.
                                                                                                    person in the given image bl.jpg is wearing a mas
                                                                                                    person in the given image b2.jpg is wearing a mas
                                                                                                    person in the given image b3.jpg is wearing a mas
                                                                                                   person in the given image b4.jpg is wearing a mas
                                                                                                    person in the given image b5.jfif is wearing a ma
                                                                                                   person in the given image b6.jpg is wearing a mas
    e person in the given image n6.jpg is not wearing a mask.
  the person in the given image n7.jpg is not wearing a mask.
                                                                                                   person in the given image b7.jfif is wearing a ma
  the person in the given image n8.jpg is not wearing a mask.
                                                                                                  person in the given image b8.jpg is wearing a mas
  The person in the given image n9.jpg is not wearing a mask.
                                                                                                person in the given image b9.jpg is wearing a mas
    person in the given image rlls.jfif is not wearing a mask.
  s person in the given image tils. Jiff is not wearing a mask.

A person in the given image png.png is wearing a mask. The person in the given image png.png is wearing a mask. The person in the civen image png.png is wearing a mask.
  a prison in the given image risingly is not wearing a mark. The person in the given image sl.jfif is wearing a mask. The person in the given image sl.jfif is wearing a mask.
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The person in the given inage risalists is verying a mask.

The person in the given inage risalists is not verying a mask.

The person in the given inage risalists is not verying a mask.

The person in the given image s4.jpg is wearing a mask.
        the person in the given image s4.jpg is wearing a mask. The person in the given image s4.jpg is wearing a mask. The person in the given image s4.jpg is wearing a mask.
    The person in the given image s3.jpg is wearing a mask. The person in the given image s3.jpg is wearing a mask. The person in the given image said in the person in the pe
      the person in the given image 52.jpg is Wearing a mask. The person in the given image so jpg is wearing a mask. The person in the given image so jpg is wearing a mask. The person in the riven image so jpg is wearing a mask. The person in the riven image so jpg is wearing a mask.
       and the time that the control is not well as a mark. The person in the given image $1.jfif is wearing a mark. The person in the given image $2 indicates the person in the
                                                                      the person in the given image png.png is wearing a mask the person in the given image of determinents.
                                                                                       person in the given image by 1pg re-
```



Thank you for listening!

