6. Treating color images

Complete the script "exercise6.m" to implement the following steps: Given the images hand.jpg (Figure 3(left)) and mapfre.jpg (Figure 3(middle)), create the function fuseImg(), which implements the following points:

The function fuseImg executed as follows, runs the steps detailed in the next subsections.

```
fuseImg()
```

The implementation of the function can be found in the Defined Function section at the end of the report.

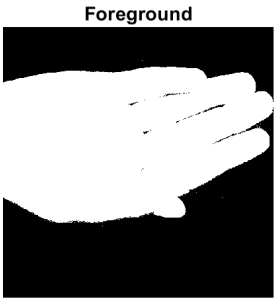
1. Open hand.jpg and convert it in gray scale image.

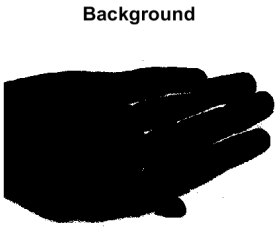
```
HAND = imread('images/hand.jpg');
MAPFRE = imread('images/mapfre.jpg');
grayscaleHand = rgb2gray(HAND);
```

2. Perform a binarization to obtain a binary image of 2 regions: the hand (called foreground) and the rest (called background). Create the inverse binary image changing the areas of foreground and background.

```
th = 20;
foregroundHand = grayscaleHand >= th;
backgroundHand = not(foregroundHand);

set(gcf,'Position',[0 0 1000 600]), ...
subplot(2,2,1), imshow(HAND), title("Original Hand"), ...
subplot(2,2,2), imshow(MAPFRE), title("Original Mapfre"), ...
subplot(2,2,3), imshow(foregroundHand), title("Foreground"), ...
subplot(2,2,4), imshow(backgroundHand), title("Background");
```





3. Use the binary matrices created in (2) to merge the images hand and mapfre (Fig. 3(right))

```
background = MAPFRE.*uint8(backgroundHand);
foreground = HAND.*uint8(foregroundHand);
handMapfre = background + foreground;
subplot(1,1,1), imshow(handMapfre), title("Hand + Mafre");
```

4. Save the image as hand_mapfre.jpg.

```
imwrite(handMapfre, 'hand_mapfre.jpg');
```

Defined Functions

```
function fuseImg()
%fuseImg Function that executes steps 1 to 4 of Exercise 6

% 1 Read Input
HAND = imread('images/hand.jpg');
MAPFRE = imread('images/mapfre.jpg');
grayscaleHand = rgb2gray(HAND);

% 2 Binarization
th = 20;
foregroundHand = grayscaleHand >= th;
backgroundHand = not(foregroundHand);

% 3 Merge
background = MAPFRE.*uint8(backgroundHand);
foreground = HAND.*uint8(foregroundHand);
handMapfre = background + foreground;

% 4 Save output
imwrite(handMapfre, 'hand_mapfre.jpg');

end
```