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PROYECTO FINAL: PROCESAMIENTO DE IMÁGENES SIGUIENDO EL CICLO V

Ingeniería Mecánica y Automotriz
Optativa de Especialidad II

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CONTENT

INTRODUCTION

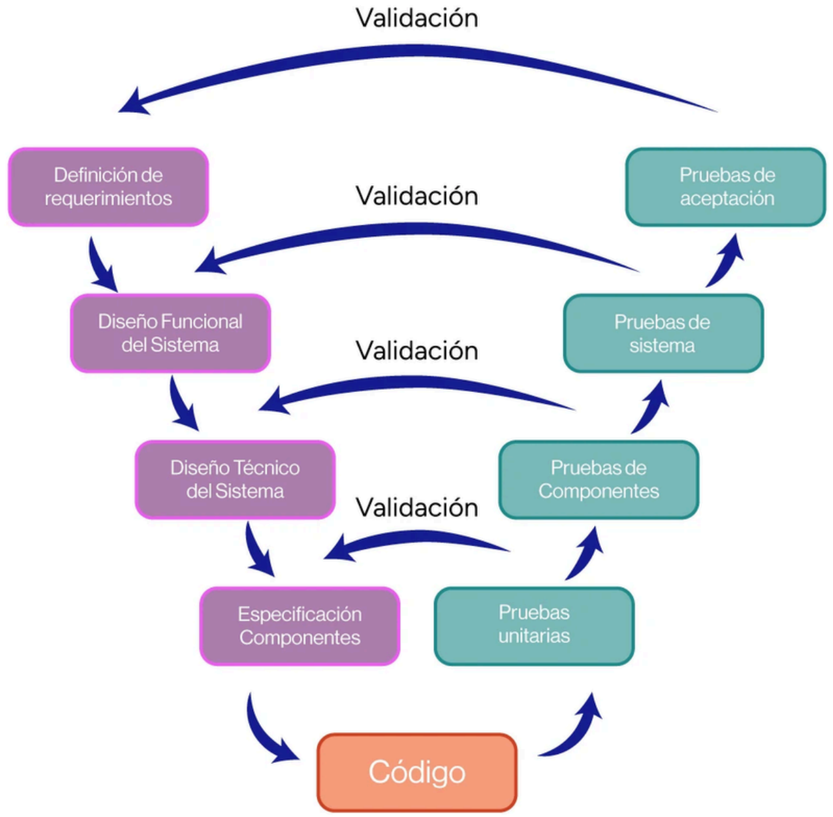


Figure1 . V cycle

IMAGE PROCESSING

Figure 2. Image processing

1. REQUIREMENTS

- The system must be able to read an image in RGB channel and convert it to gray scale and get a threshold from the image to finally convert it to a binarized image and save it in the same folder.

- The process previously described must be repeated with ten images provided by the customer, the expectation is that the results are very similar in all tests.

1. REQUIREMENTS

- The system must be able to read an image in RGB channel from the same folder where the code is saved.

- The system must be able to convert the RGB image to gray scale using “im2gray” function in Matlab libraries and get a threshold from the image to finally convert it to a binarized image and save it in the same folder.

- The process previously described must be repeated with ten images provided by the customer, the expectation is that the results are very similar in all tests.

2. PROTOTYPE

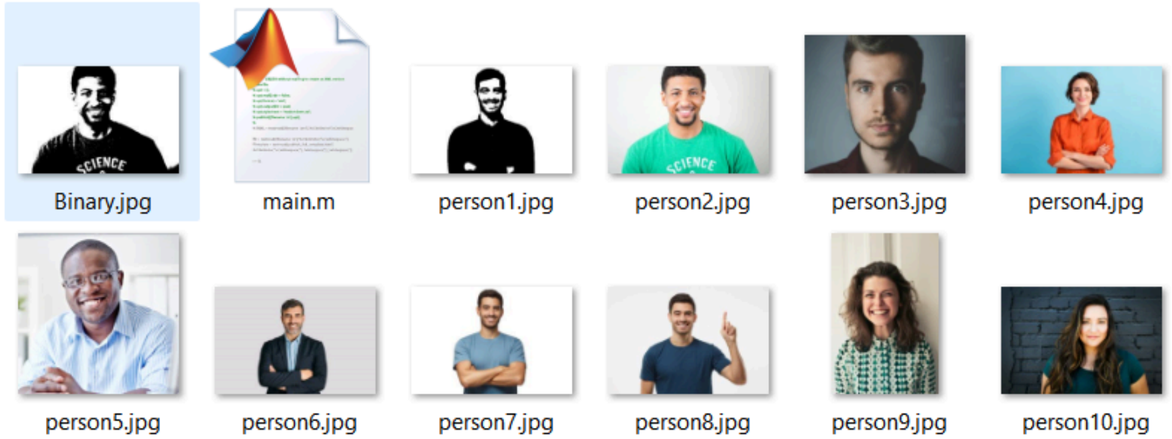


Figure 3. Test Images

```
close all;
clear all;
clc;

%% Open image
name = "person2";
A = imread(name,"jpg");   % read the image
subplot(1,3,1);
imshow(A);                % show the image as original
title('Original image')

%% Convert to grays scale
G = im2gray(A);
subplot(1,3,2);
imshow(G);
title('Gray scale image')

%% Binaryzation
graylevel = graythresh(G);
BinImage = imbinarize(G,graylevel);
subplot(1,3,3);
imshow(BinImage);
title('Binaryzed image')

%% Write binaryzed image
imwrite(BinImage,"Binary.jpg");
```

3. COMPONENTS

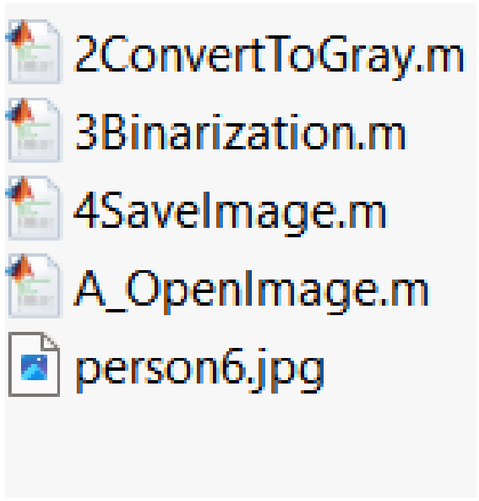


Figure 4. Components

4. CODE

```
close all;
clear all;
clc;

%% Open image
name = "person2";
A = imread(name,"jpg");  % read the image
subplot(1,3,1);
imshow(A);               % show the image as original
title('Original image')

%% Convert to grays scale
G = im2gray(A);
subplot(1,3,2);
imshow(G);
title('Gray scale image')

%% Binaryzation
graylevel = graythresh(G);
BinImage = imbinarize(G,graylevel);
subplot(1,3,3);
imshow(BinImage);
title('Binaryzed image')

%% Write binaryzed image
imwrite(BinImage,"Binary.jpg");
```

Figure 5. Main code

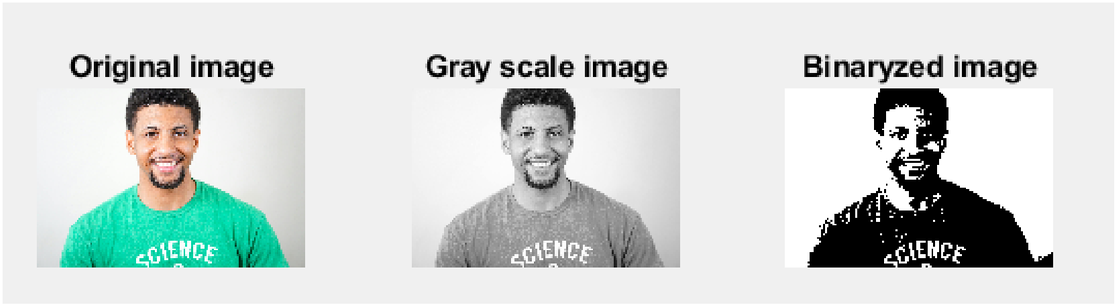


Figure 6. Results

5. UNIT TEST

Open Image

```
%% Open image
name = "person6";
A = imread(name,"jpg");  % read the image
imshow(A);               % show the image as
title('Original image')
```

```
Command Window
>> name = "person6";
>> A = imread(name,"jpg");  % read the image
>> imshow(A);               % show the image as original
>>
```

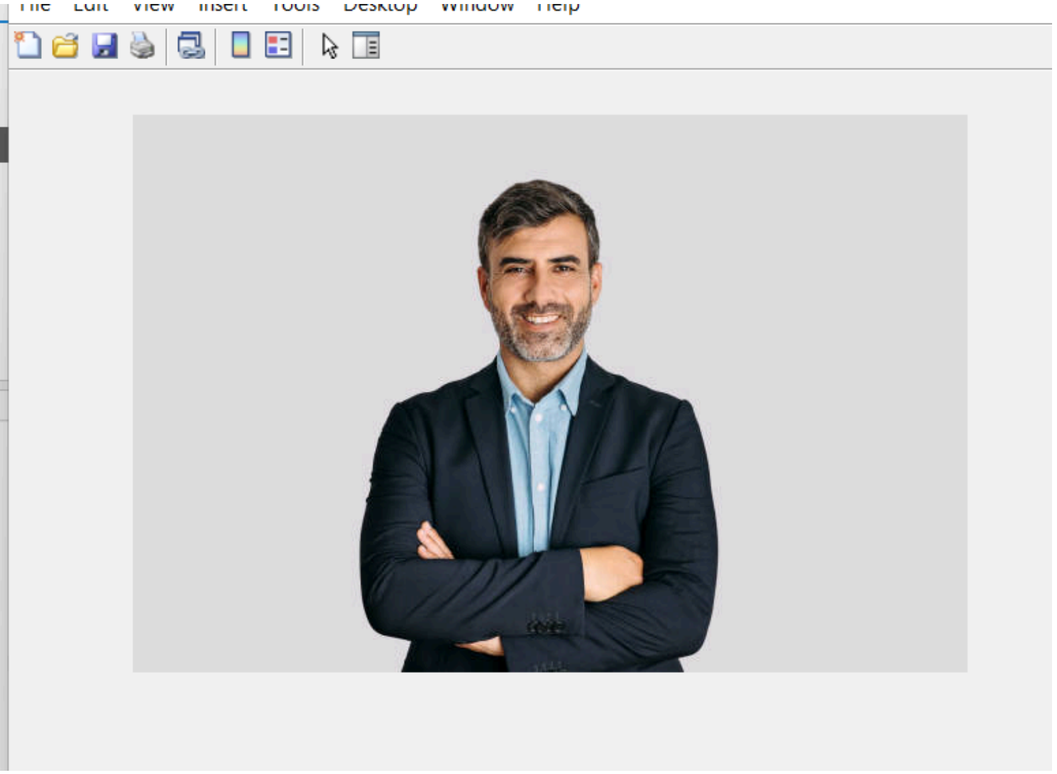
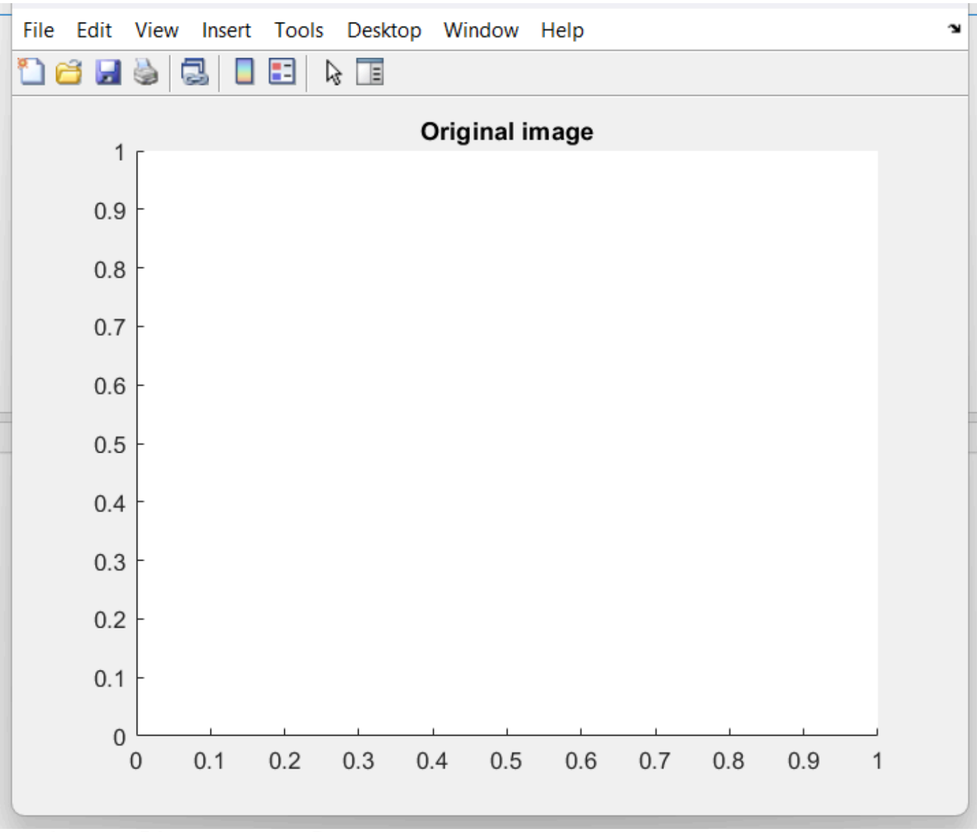


Figure 7. Testing lines of “Open Image” 1.0

5. UNIT TEST

Open Image

```
%% Open image
name = "person6";
A = imread(name,"jpg");  % read the image
imshow(A);               % show the image as original
title('Original image')
```




```
Command Window
>> title('Original image')
>>
```

Figure 8. Testing lines of “Open Image” 2.0

5. UNIT TEST

Convert to Grays Scale

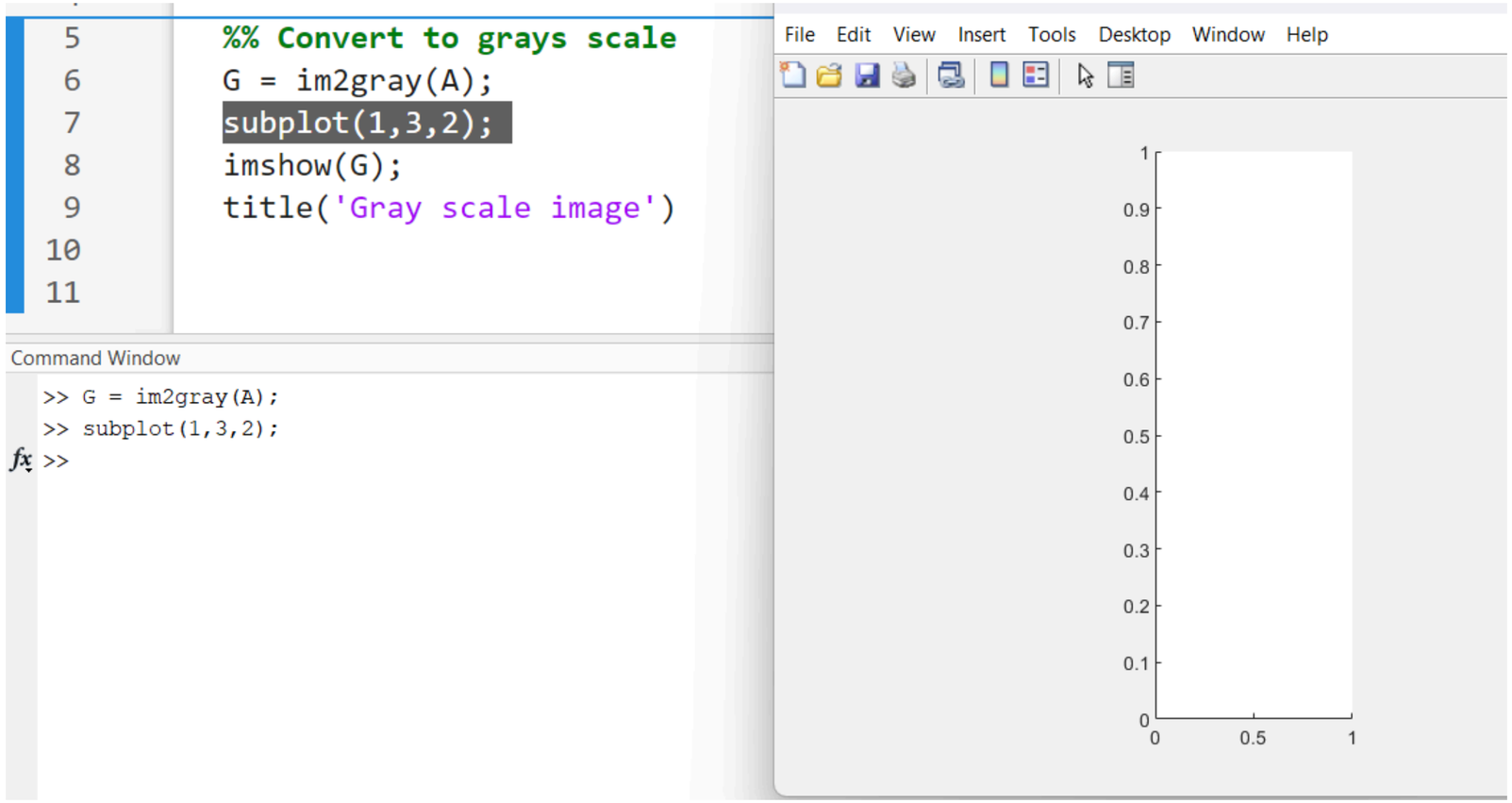


Figure 9. Testing lines of “Convert to grays scaele” 1.0

5. UNIT TEST

Convert to Grays Scale

```
5   %% Convert to grays scale
6   G = im2gray(A);
7   subplot(1,3,2);
8   imshow(G);
9   title('Gray scale image')
10
11
```

Command Window

```
>> G = im2gray(A);
>> subplot(1,3,2);
>> imshow(G);
>> title('Gray scale image')
>>
```

Figure 10. Testing lines of "Convert to grays scaele" 2.0

5. UNIT TEST

Binaryzation

```
18    %% Binaryzation
19    graylevel = graythresh(G);
20    BinImage = imbinarize(G,graylevel);
21    subplot(1,3,3);
22    imshow(BinImage);
23    title('Binaryzed image')
24
```

Command Window

```
>> graylevel = graythresh(G);
>> BinImage = imbinarize(G,graylevel);
>> subplot(1,3,3);
>> imshow(BinImage);
>> title('Binaryzed image')
>>
```

Figure 11. Testing lines of "Binaryzation"

5. UNIT TEST

Save Image

```
25    %% Write binaryzed image
26    imwrite(BinImage,"Binary.jpg");
27
28
```

Command Window

```
>> imwrite(BinImage,"Binary.jpg");
>>
```

Figure 12. Testing lines of “Save Image”

6. COMPONENT TEST

```
close all;
clear all;
clc;

%% Open image
name = "person9";
A = imread(name,"jpg");  % read the image
imshow(A);               % show the image as original
title('Original image')
```

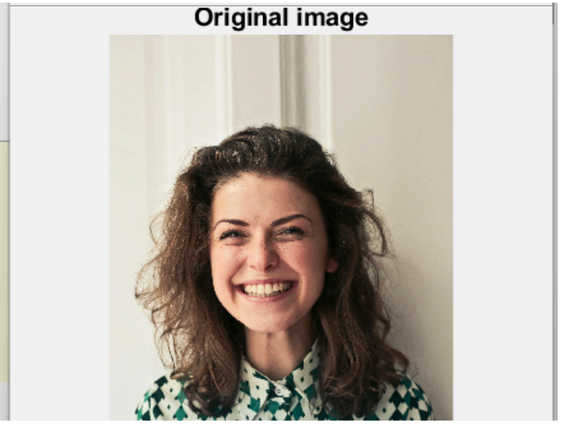


Figure 13. Open Image Component

```
close all;
clear all;
clc;

%% Convert to grays scale
G = im2gray(A);
subplot(1,3,2);
imshow(G);
title('Gray scale image')
```

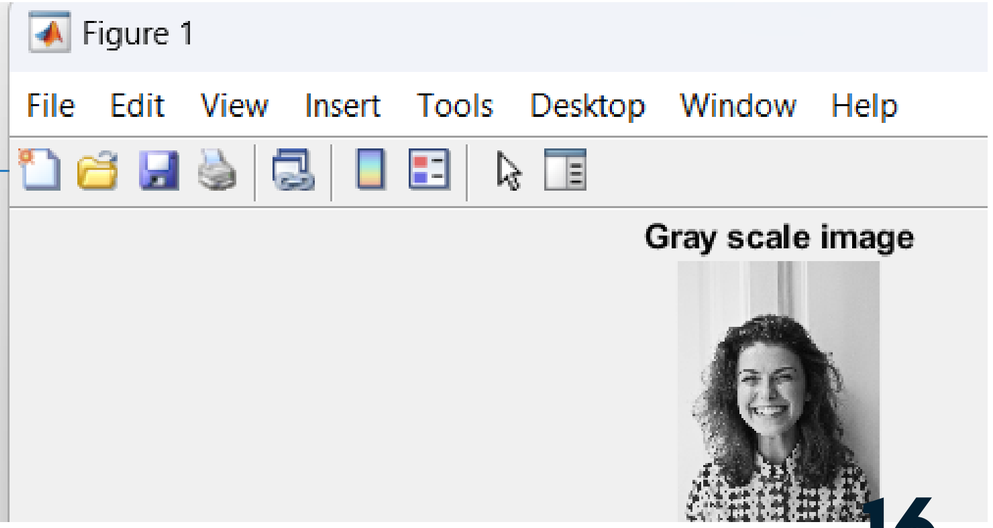


Figure 14. Convert to gray Component

6. COMPONENT TEST

```
close all;
clear all;
clc;
```

```
%% Binaryzation
graylevel = graythresh(G);
BinImage = imbinarize(G,graylevel);
subplot(1,3,3);
imshow(BinImage);
title('Binaryzed image')
```

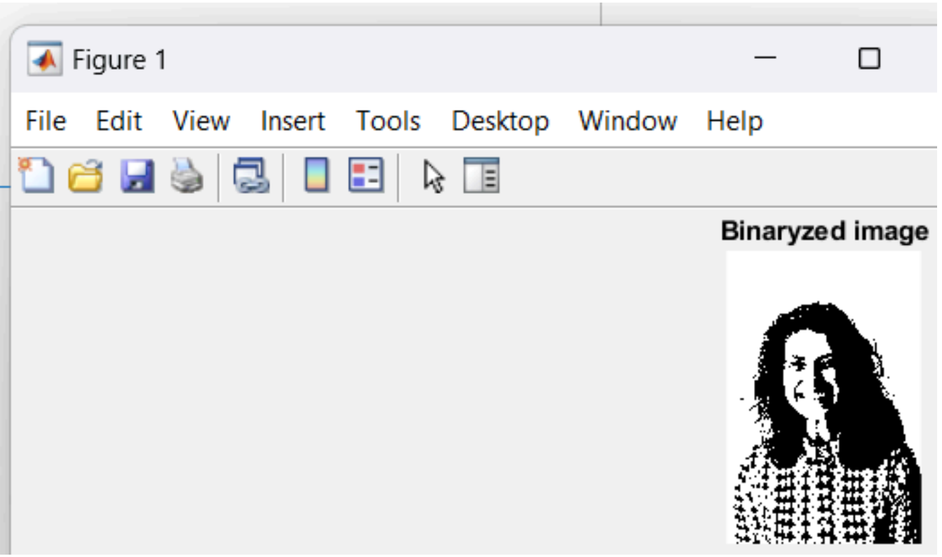


Figure 15. Binaryzation Component

```
%% Write binaryzed image
imwrite(BinImage,"Binary.jpg");
```

Figure 16. Write binaryzed image Component

7. SYSTEM TEST

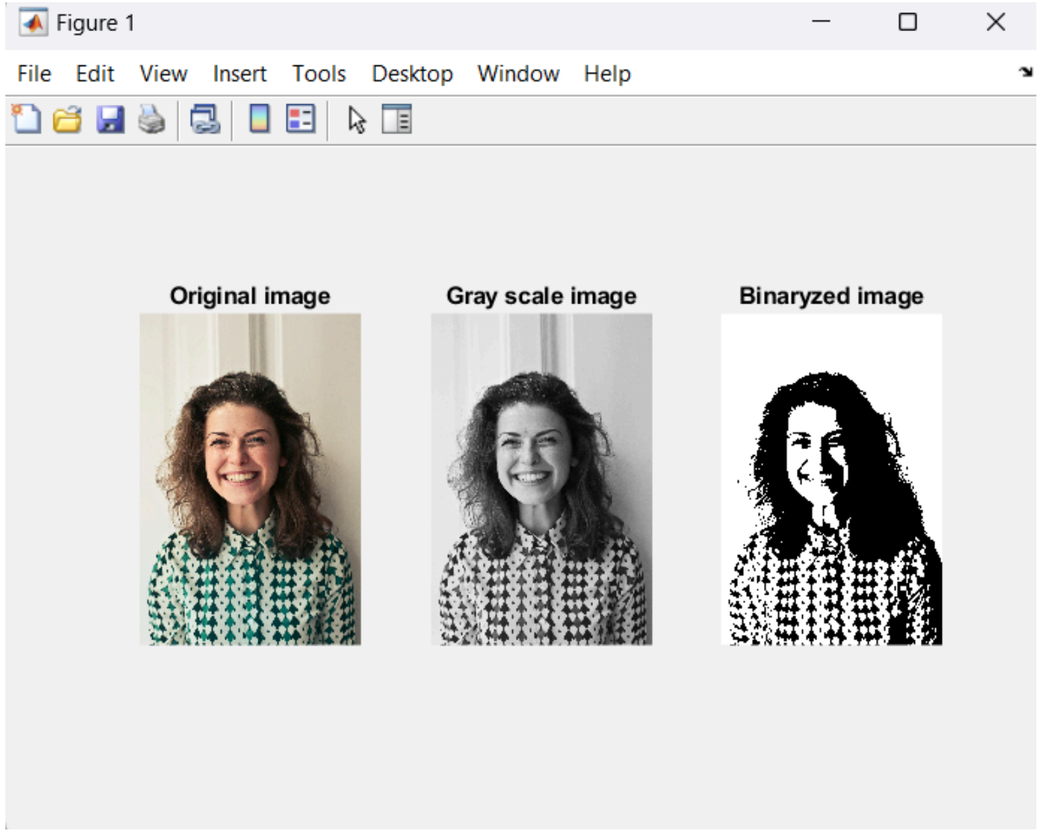


Figure 17. Result system test

8. ACCEPTANCE TEST

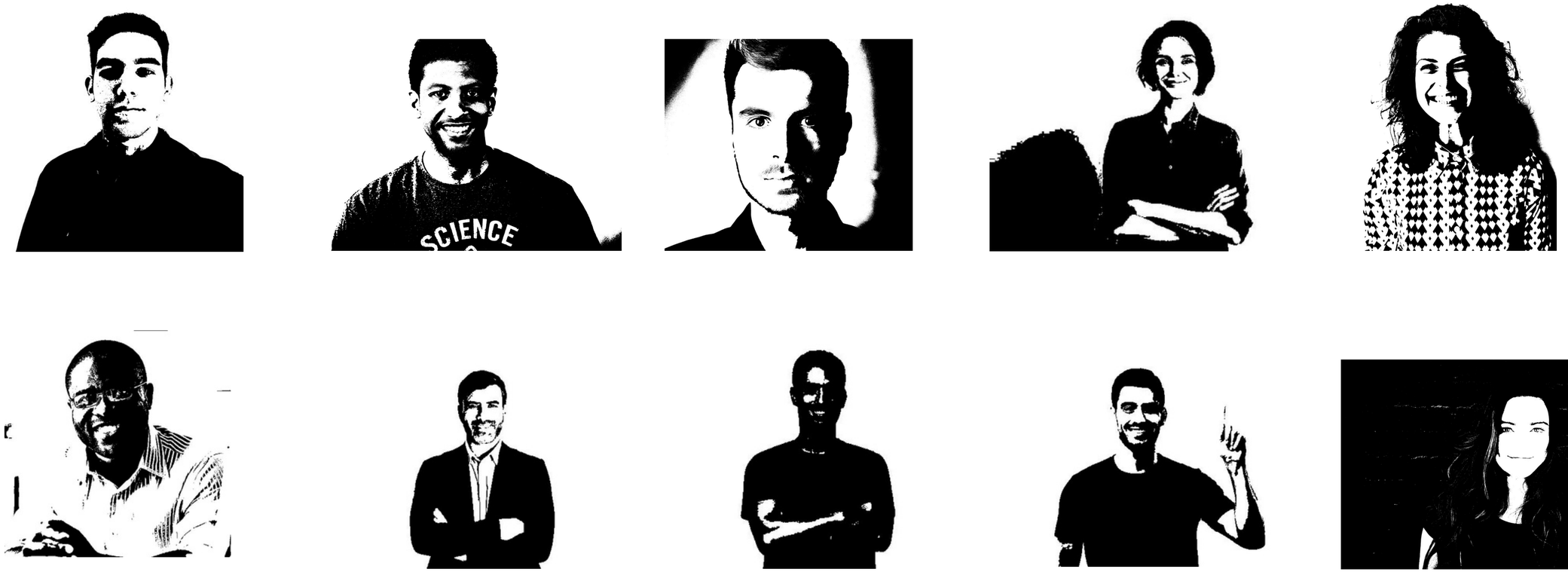


Figure 18. Results

9. CONCLUSIONS

THANK YOU!