Session 19

With the aim of determining the coordinates of the handles, on OpenCv I started to process the image containing a handle. As the picture is of small surface, including a lot of curvature. I had to deal with several problems.

First, to process the image, I put it in black and white, then add a blurring filter to reduce the noise and finally detect the contours. Define the outline of the largest surface alias the door, zoom in, approximate a rectangle around the handle, calculate its air and perimeter by posing:

```
handle_x = x + w / 2
handle_y = y + h / 2
```

We obtained the coordinates: (320,410).

To check if the result is logical, I draw a line between the origin of the marker (0,0) and the point found. The point did not represent the handle.

This error is mainly due to a Problem of discontinuity of detected contours as can be seen (fig 1).

The left side of the door is partially detected but discontinuous, as long as the right side is absolutely not detected because of the space between the care and the door.

The Findcountours function used to detect the outlines was therefore unsuitable, so I looked for a new alternative, the Canny function. Which this time detected the edges, the door is better detected (Fig 2), we even manage to see the handle through it, which was not the case with FindContours.

Fig 1: outlines detection with FindContours

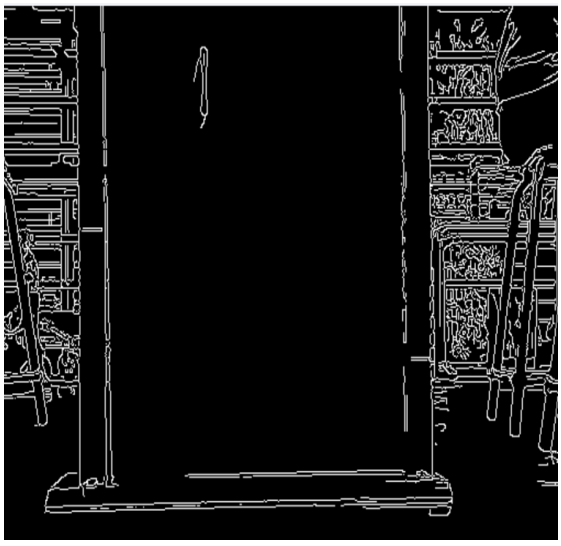

Fig2 : edges detection with Canny

Unfortunately, with the Canny function, we can not define the max area simply with :

```
cnt = max(contours, key=cv2.contourArea)
```

thus, we need to download Numpy, using Numpy with Opencv we can manage to determine max.edges.

In our cas, it’s estimated to 255.

Actually, I am still documenting myself on the use of numpy to be able o think of a new procedure.