First step : Hough transform
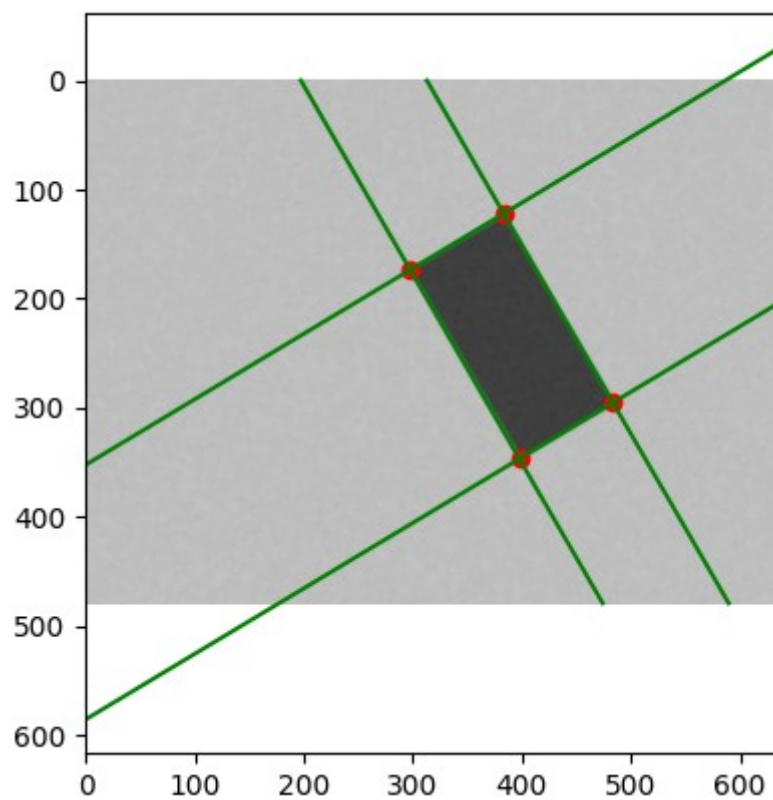
The method *houg_line_peaks* gives us 4 lines to have the shape of the object.
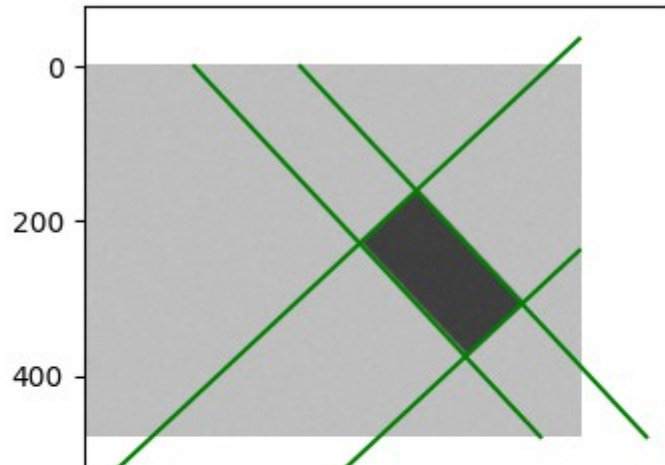
Second step : Find corners

We compute the corners with or function *line_intersection*.
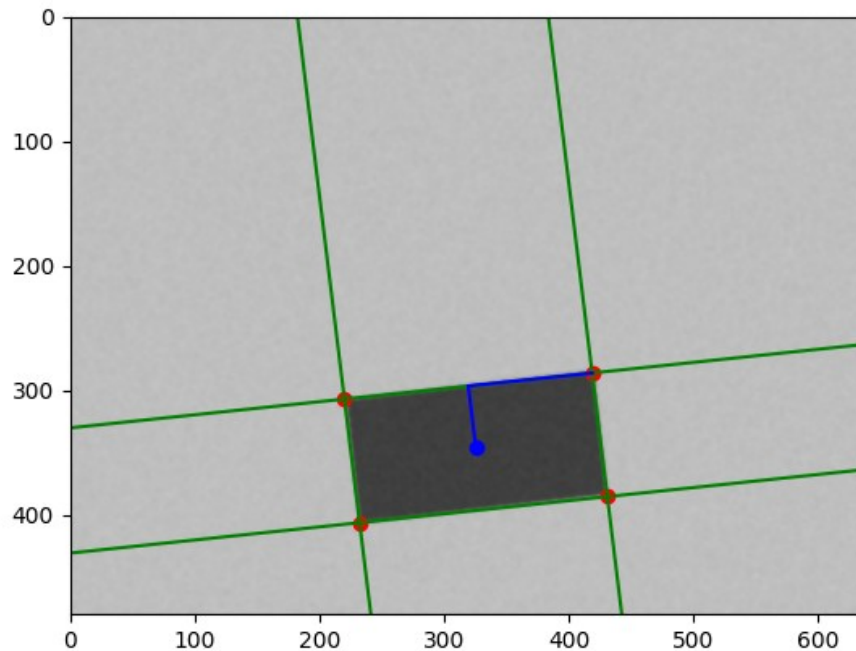
Third step: Compute t
We take two lines who intersect with each other.
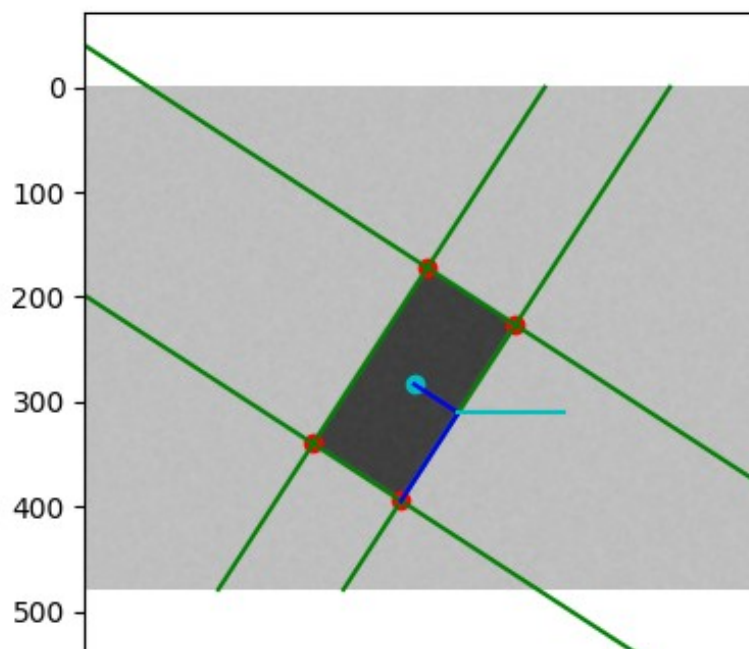We find the commun point of this two lines, which is one of the four coners.
Then we can compute the two blue vectors.
Thanks to these two vectors, we can find de center of the object.

Fourth step : Compute alpha
To compute alpha, we compute the angle between the longest one of the blue vectors and the vector in cyan that is represented in below.

You can see below the result of *e_alpha* and *e_t* when we compute 100 times t and alpha.
(use the function *statsTask4()* in the *main* function to compute and plot this kind of test)
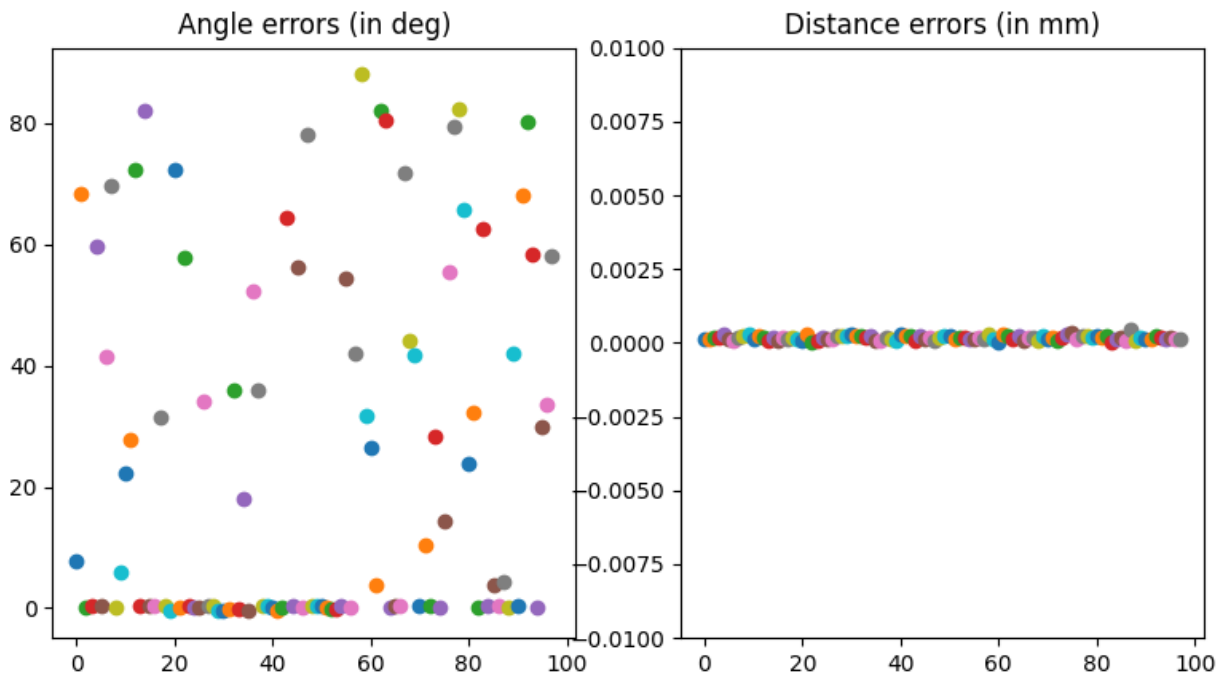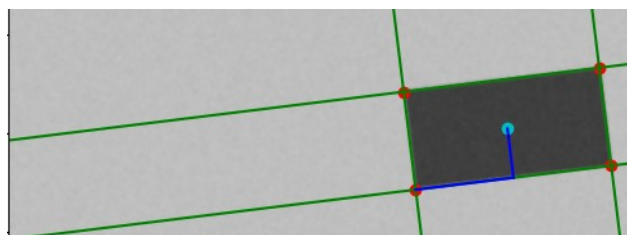

In this test, I found 51,02 % of the angle which are correct. Half the time, my program compute an error between 0 and 90 degrees. I didnt't find the solution of my problem.

However, the position is everytime computed correctly.

Examples :
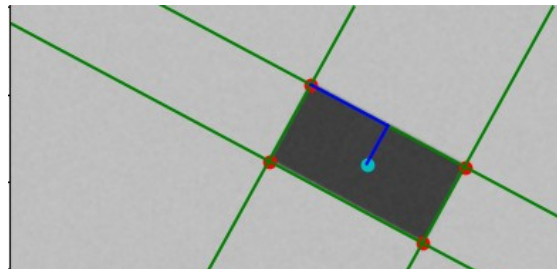

```
alpha = 0.4886921905584122 rad
t= [0.045170325186019114, -0.030162693863254673, 0.5]
orientation error: 0.229791 deg position error: 0.101201 mm
```



```
alpha = 0.12217304763960259 rad
t= [0.09339133486266238, 0.027720450231232745, 0.5]
orientation error: 13.697321 deg position error: 0.146575 mm
```