Plotting on images

In this exercise we will see how to plot lines on images. First of all, it is necessary to collect input from the user to define a line. After displaying the image, the user is asked to select two points $x_1, x_2$ on the image, defining a line.

At this point, in order to draw the entire line on the image the following steps are required:

1. Compute the line passing by the points $x_1$ and $x_2$ by means of the cross product of their homogeneous representation:
   \[ l_s = x_1 \times x_2 \]

2. Compute the lines which form the borders of the image $l_l, l_r, l_t, l_b$.

3. Compute the intersection points of line $l_s$ with the borders.

4. Select two intersection points which lie inside the image $p_1, p_2$.

5. Plot the line between the points $p_1$ and $p_2$.

Practical Exercise

You are asked to go through the following steps:

Load image: Load the image `gantrycrane.png` included in the Image Processing Toolbox.

Display image: Display the image on the screen.

Select points: Let the user select two points on the image.

Define line: Define the line passing from the two selected points.

Visible line segment: Write a function which takes as input a line in homogeneous coordinates and returns the intersection points of the line with the borders of the image.

Plot line: Plot the line segment between the selected points, and then use the implemented function to plot the line segment that is visible in the image.

Reminder

Hint 1 You can select points on an image by using the `ginput` Matlab function.

Hint 2 You can complete the exercise at home!