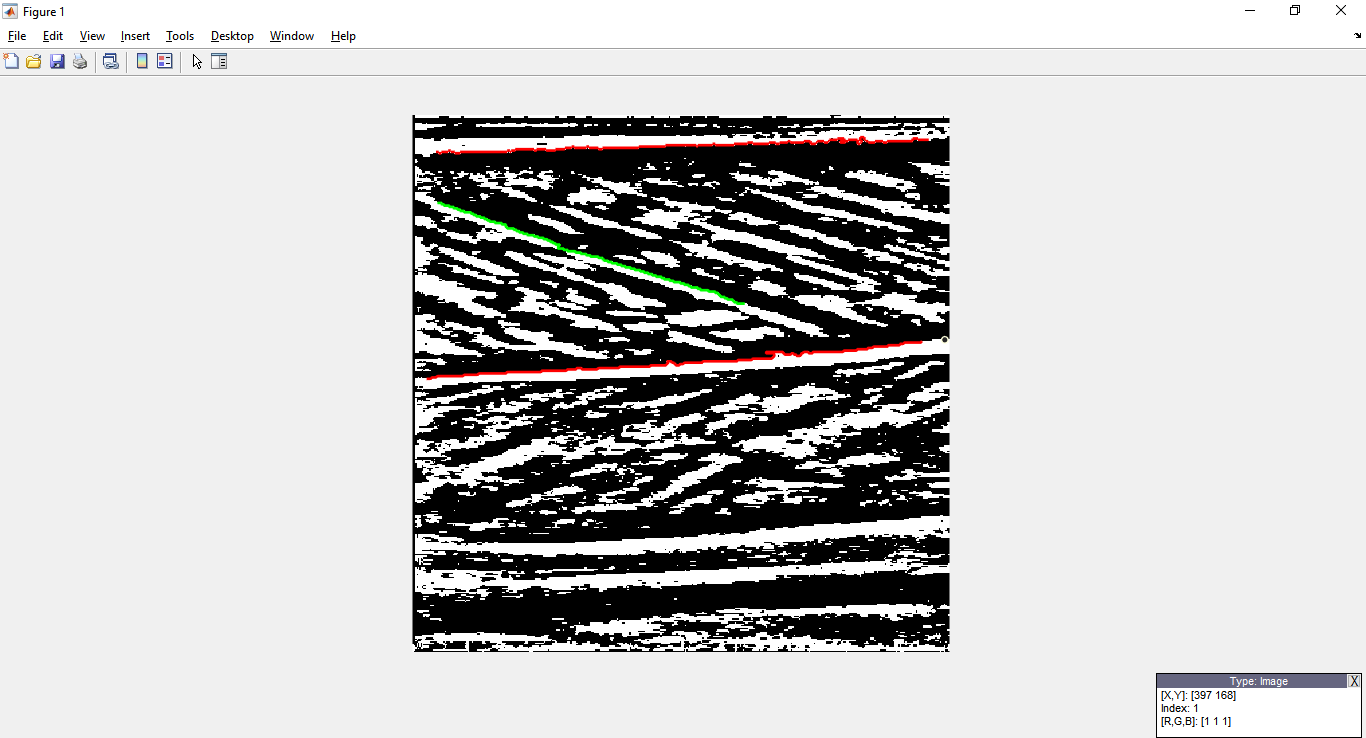
Semi-automatic Ultrasound tracking computation

1. Step 1: Angle Calculation
2. Linear regression of the points composing the boundary of the objects of interest.





**Ap2 = AAp2 x + BAp2**

**Ap1 = AAp1 x + BAp1**

**Fl = AFl x + BFl**

Function used: *Polyfit*

1. Transform equation line to vector.

With AFl | AAp1 | AAp2 the respective slope of Fl Ap1 and Ap2.

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To find the angle θ between two vectors we use this formula:

1. Calculate the norm of each vector.

In MATLAB we use the *norm()* function.

The calculation used by the function is as follows:

For and the slope of the Fl equation line

1. Calculate the dot product of the two vector.

In MATLAB we use the *dot()* function

The calculation used by the function is as follows:

1. Plug the results into the formula.
2. Find The Angle based on the cosine.

In MATLAB we use the *acosd()* function.

The calculation used by the function is as follows:

1. Step 2: Fl Length Calculation
2. Solve the two linear equations || AFl x + BFl = AAp1 x + BAp1

Given:

Transform into Matrix Form:

Rearranged:

*Constant*

*Coefficient*

*Coefficient*

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Translate into MATLAB language:

CoefMat = [0.327 -1; -0.0274 -1]

ConstMat = [-60.73; -28.94]

Decomposition:

*%% Backslash is used to solves the system of linear equations*  
IntersectionCoordinate( 1 , : ) = CoefMat\ ConstMat

Do the same computation for Fl and AP2, to get the second intersection point.

1. Fascicle Length