

How the FabScan configuration.xml file works

Ian (eon in our fabscan google group) explained how the configuration.xml file works. For a normal user, it is not important, to touch this file, but it is good to understand how things work:

This is from the original file:

```
<?xml version="1.0"?>
<opencv_storage>
<Configuration>
```

These define the position of the laser. If you built the 'official' FabScan Cube box then these are already correct. If you are making your own then the X Y Z are as seen from the camera, so X is across, Y is up/down and Z is depth. Laser Y is irrelevant because the laser is a vertical line. Values are in centimeters -

```
<!-- LASER POSITION -->
<!-- Should be precise by construction -->
<LASER_POS_X>14.0</LASER_POS_X>
<!-- Not used by calculations -->
<LASER_POS_Y>6.4</LASER_POS_Y>
<!-- Should be precise by construction -->
<LASER_POS_Z>28.8</LASER_POS_Z>
```

These define the position of the camera - specifically the sensor in the camera, behind the lens. X by definition is 0.0: the camera/turntable line is X=0

```
<!-- CAMERA POSITION -->
<CAM_POS_Y>5.57</CAM_POS_Y>
<CAM_POS_Z>30.9</CAM_POS_Z>
```

These define the position of the turntable. As noted above, X is defined as 0.0. Y is 0.0 because it is the vertical surface. Z is 7.5 because that is the distance of the turntable centre from the backplane. I made a change in my code that defines the centre of the turntable as Z=0.0 so that the software no longer needs to see the laser on the backplane and thus you don't need a backplane. So for current versions of my software set all three below to 0.0

```
<!-- TURNTABLE POSITION -->
<!-- Not used by calculations -->
<TURNTABLE_POS_X>0.0</TURNTABLE_POS_X>
<!-- Not used by calculations -->
<TURNTABLE_POS_Y>0.0</TURNTABLE_POS_Y>
<!-- Precise by construction -->
<TURNTABLE_POS_Z>7.5</TURNTABLE_POS_Z>

<!-- ADDITIONAL CONFIGS -->
```

This sets the 'top' of the scan; anything above this line isn't 'seen'. This line is yellow, but at the default value of 0 it is right at the top and isn't visible-

```
<!-- To speed up computations we analyze the laser frame only after a
certin offset from top -->
<UPPER_ANALYZING_FRAME_LIMIT>0</UPPER_ANALYZING_FRAME_LIMIT>
```

This sets the 'bottom' of the scan; anything below this line isn't 'seen'. This line is the lower yellow line. This would normally be set at the front edge of the turntable-

```
<!-- To speed up computations we analyze the laser frame only upt oa
certin offset from bottom -->
<LOWER_ANALYZING_FRAME_LIMIT>30</LOWER_ANALYZING_FRAME_LIMIT>
```

This sets the left and right edge of the scan. There are no marker lines for these-

```
<!-- To avoid noise, we stop analyzing the frame from right to left after
a certain ofset of the estimated laser position -->
<ANALYZING_LASER_OFFSET>90</ANALYZING_LASER_OFFSET>
```

This sets the 'horizon' as seen by the camera; with the original software this blue line would sit at the join between the turntable and backplane, but as I no longer use the backplane this should position the blue line across the middle of the turntable-

```
<!-- In % from top, position of blue line (when pressing fetch frame)-->
<!-- This should be the intersection of the back plane and the bottom
plane -->
<ORIGIN_Y>0.75</ORIGIN_Y>
```

This sets the scale of the object (i.e. its size). As noted in the file it is the width of the camera view at the 0 depth point: with my software that means at the turntable centre-

```
<!-- In cm the width of what the camera sees, ie place a measure tool at
the back-plane and see how many cm the camera sees.-->
<!-- This is a cheap way of calibration -->
<FRAME_WIDTH>26.6</FRAME_WIDTH>
```

This is so the software knows the maximum resolution of the camera-

```
<!-- The resolution of the images coming from the camera -->
<CAM_IMAGE_WIDTH>1280.0</CAM_IMAGE_WIDTH>
<!--<CAM_IMAGE_HEIGHT>960.0</CAM_IMAGE_HEIGHT>-->
<CAM_IMAGE_HEIGHT>960.0</CAM_IMAGE_HEIGHT>
```

```
<!-- Currently not implemented -->
```

<!-- When there is a stepper attached to the laser, we can swipe the laser over the object, here we define the minimum and maximum angle where the laser starts and ends -->

```
<!-- The minimal angle -->
<LASER_SWIPE_MIN>18.0</LASER_SWIPE_MIN>
<!-- The maximum angle -->
<LASER_SWIPE_MAX>52.0</LASER_SWIPE_MAX>
```

Added by Ian for the Windows version. This was because he uses a different type of stepper. This doesn't need to be in the file, but if it is it represents the number of steps to rotate the turntable by 360*

```
<!-- Number of steps to turn 360* -->
<TURNTABLE_STEPS_360>2038</TURNTABLE_STEPS_360>
```

```
</Configuration>
```

```
</opencv_storage>
```

More information about the FabScan 3D-scanner:

<http://hci.rwth-aachen.de/fabscan>