

## Image Rotation

Image rotation is performed by transforming the original pixels into destination pixels. Pixels in the resulting picture are calculated using the interpolation method. In MatDeck, there is a function called `image rotate()` which is vital for effective image rotation. As the arguments of the function, one can set the coordinates of the point of rotation in two dimensions, angle of rotation in degrees, and alternatively the interpolation method. There are two interpolation methods: nearest neighbor, and bilinear interpolation.

In order to illustrate image rotation, we will process an image of the leaning tower in Pisa, Italy. The image file contains 300 by 503 pixels. As is widely known, the Pisa tower leans 5.5 degrees, we will try to put it back in a vertical stance by using the image rotation function provided in MatDeck. We show the original image and rotated image in parallel. We set the point of rotation to the bottom left edge of the image whose coordinates are: horizontal - 0, and vertical - 503, in pixels.

```
1 img := image read("pisa.jpeg")
2 img_r := image rotate(img, 0, 503, -5.5, "nearest")
3 pic1 := image widget(0, img)
4 set size(pic1, 330, 503)
5 pic2 := image widget(0, img_r)
6 set size(pic2, 330, 503)
```

