Project 2 Basic Image Operations

1. Purpose

The purpose of this experiment is to learn some basic image operations, including image subsampling, changing the number of image gray-levels, image rotation, image interpolation, etc. Observe the changes arisen by the operations and analyze the reasons.

2. Contents

1) According to the description of Example 2.2 in page 82, generate different spatial resolution of the original image, observe the changes in the resulting image, analyze the reason and give your conclusion.

2) According to the description of Example 2.3 in page 84, generate different intensity resolution of the original image, observe the changes in the resulting image, analyze the reason and give your conclusion.

3) Rotate an image by 30 degrees in counter clockwise, using nearest interpolation, bilinear interpolation and bicubic interpolation respectively to fill the holes resulted by the non-integer coordinates.

3. Discussion

1) How does the image quality change with decrease of image spatial resolution?

2) What is the relationship between the image quality and the intensity resolution?

3) Why does the image rotation need interpolation?