Biomedical Image Processing - Researching Interpolation in Images

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Project Overview

In this project I implemented a program that can take in a coloured MxN image, convert it to grayscale and scale the image to a user defined aMxbN sized image while preserving the FOV.

To execute the function run the Ass2_main script, or to test a unique aMxbN solution run:

output = scale_MN(grayScaleImg, a, b);

Figure1: Original Mugshot photo (1280x960)

Figure 2: Mugshot image scaled to 640x1920

Scale 1: Mugshot (384x288)

MxN = 1280x960
a = 0.3 | $\Delta m = 1/a = 3.33$
b = 0.3 | $\Delta n = 1/b = 3.33$
aMxbN = 384x 288

Figure1: Original Mugshot photo (1280x960)

Figure 3 Mugshot image scaled by a = 0.3 b = 0.3

Scale 2: Mugshot (1152x384)

MxN = 1280x960
a = 0.9 | $\Delta m = 1/a = 1.11$
b = 0.4 | $\Delta n = 1/b = 2.5$
aMxbN = 1152x384

Figure1: Original Mugshot photo (1280x960)

Figure 4 Mugshot image scaled by a = 0.9 b = 0.4

Scale 3: Mugshot (128x9600)

MxN = 1280x960
a = 0.1 | Δm = 1/a = 10
b = 10 | Δn = 1/b = 0.1
aMxbN = 128x9600

Figure1: Original Mugshot photo (1280x960)

Figure 5 Mugshot image scaled by a = 0.1 b = 10

Scale 4: Mugshot (2560x1920)

$MxN = 1280x960$
$a = 2 \mid \Delta m = 1/a = 0.5$
$b = 2 \mid \Delta n = 1/b = 0.5$
$aMxbN = 2560x1920$

Figure1: Original Mugshot photo (1280x960)

Figure 6 Mugshot image scaled by a = 2 b = 2

Scale 5: Mugshot (1920x3360)

MxN = 1280x960
a = 1.5 | Δm = 1/a = 0.66
b = 3.5 | Δn = 1/b = 0.29
aMxbN = 1920x3360

Figure1: Original Mugshot photo (1280x960)

Figure 7 Mugshot image scaled by a = 1.5 b = 3.5

Scale 6: Mugshot (12800x960)

MxN = 1280x960
a = 10| Δm = 1/a =0.1
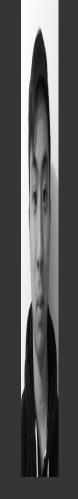b = 1 | Δn = 1/b =1
aMxbN = 12800x960

Figure1: Original Mugshot photo (1280x960)

Figure 8 Mugshot image scaled by a = 10 b = 1