**第九章作业**

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**实验名称**： 科学计算和可视化

1. 解方程，其中：

**算法实现：**

import numpy as np

from numpy.linalg import inv

A = np.array([[1,0.5,5],[2.3,2,3],[4,1,1.7]])

b = np.array([[1,2,3]])

c = np.transpose(b)

x = np.matmul(inv(A),np.transpose(b))

print(x)



1. 绘制一副自己的人物肖像的手绘效果图

算法实现：

from PIL import Image

import numpy as np

vec\_el = np.pi/2.2

vec\_az = np.pi/4

depth = 50.

im = Image.open('E:\\python作业\\么么.jpg').convert('L')

a= np.asarray(im).astype('float')

grad = np.gradient(a)

grad\_x, grad\_y = grad

grad\_x = grad\_x\*depth/100.

grad\_y = grad\_y\*depth/100.

dx = np.cos(vec\_el)\*np.cos(vec\_az)

dy = np.cos(vec\_el)\*np.sin(vec\_az)

dz = np.sin(vec\_el)

A = np.sqrt(grad\_x\*\*2 + grad\_y\*\*2 + 1.)

uni\_x = grad\_x/A

uni\_y = grad\_x/A

uni\_z = 1./A

a2 = 255\*(dx\*uni\_x + dy\*uni\_y +dz\*uni\_z)

a2 = a2.clip(0,255)

im2 = Image.fromarray(a2.astype('uint8'))

im2.save('么么3.jpg')

