

CSC4140 Assignment I

Computer Graphics

February 8, 2022

Learn to use VirtualBox and Mathematic Review

This assignment is 5% of the total mark.

Strict Due Date: 11:59PM, Feb 14th, 2022

Student ID: 118010335

Student Name: Wei WU

This assignment represents my own work in accordance with University regulations.

Signature:

1 Basic operations of vector and matrix

1.1 Basic vector operations

[problem 2]

0.333333

0.75

1.16667

[problem 3]

0.458333

[problem 4]

0.0833333

-0.166667

0.0833333

1.2 Basic matrix operations

[problem 2]

5 5 5 5

13 13 13 13

21 21 21 21

29 29 29 29

[problem 3]

120 110 100 90

280 254 228 202

440 398 356 314

600 542 484 426

[problem 4]

22

52

82

112

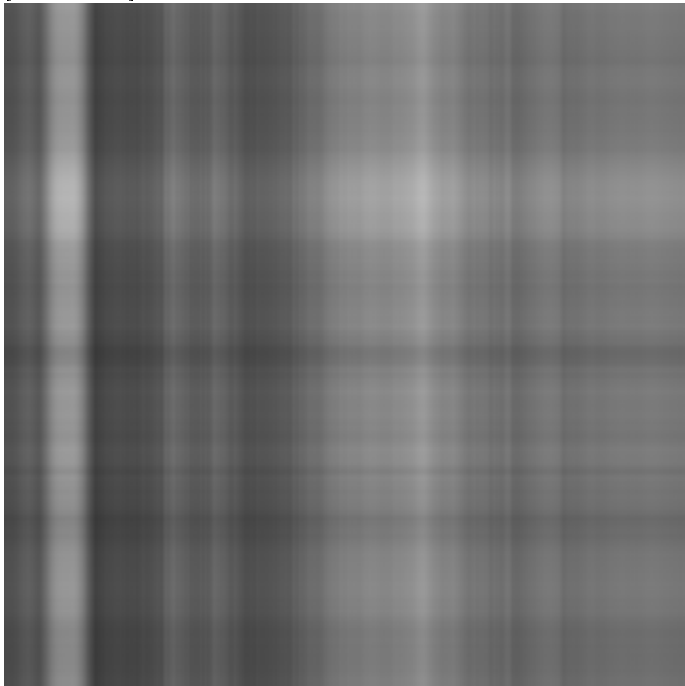
1.3 SVD decomposition of "lenna"

Note: Please reinstall OpenCV2 from the official website.

[problem 1]



[problem 3]



[problem 4]



[problem 5]



[problem 6]

Explanation:

Initially, we use only 1 out of 512 singular values. That is, 511/512 of the features are discarded. Therefore, the image is very vague. Then, when we use 10 singular values, the feature map becomes clearer since more features of the picture are extracted. Lastly, when we use 50 singular values, the feature map becomes even clearer.

1.4 Basic transformation operations

1.6403

0.912883

3.82576