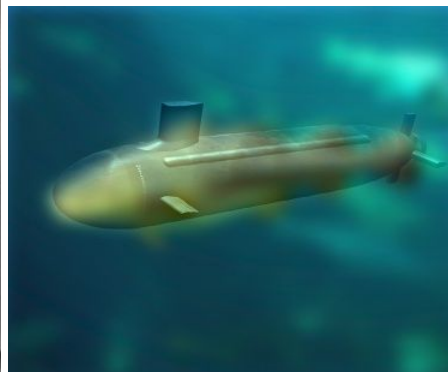


DSP Lab 6 Report  
DSP Lab 6  
電機 19 紀伯翰 104061171

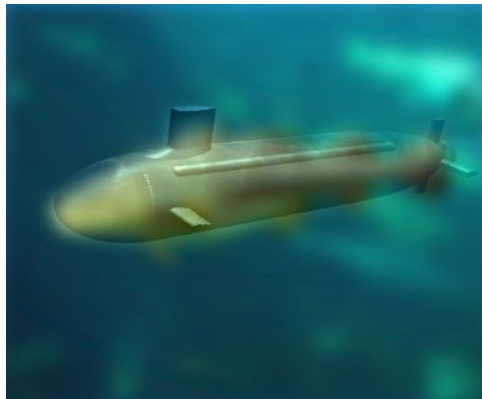
1a. Specification:

(5%) Write up with several examples of hybrid images.

1b. Implementing:



(張正尚 胖虎)

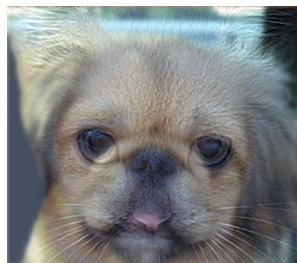
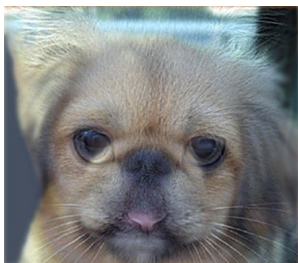


(宋芸樺,小瀨田麻由)

2a.Specification: (5%) Try different setting of the cutoff\_frequency (ex:3,7,11) in proj1.m and explain what you observe (execute time, filter kernel size, blurred quality).

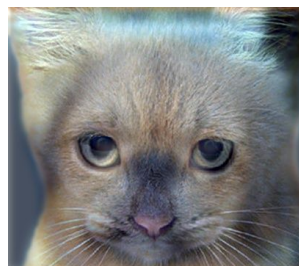
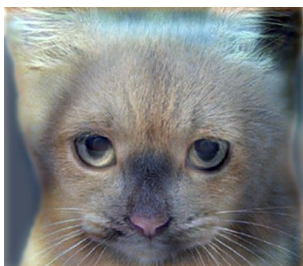
2b.Implementing:

Frequency =3



Elapsed time is 3.236884 seconds.

Frequency =7



Elapsed time is 5.625316 seconds.

Frequency=11



Elapsed time is 9.502907 seconds.

## 2c. Discussion

假設使用frequency越大的，運算的時間會越久，因為每次在算的時候，filter的面積變大，所要運算的部份就越多，低頻的圖片會越blur，高頻會越銳化。

## 3a. Specification

3. (10%) Explain why the high-frequency images will be seen at the close distance (larger one) while the low-frequency images will be seen at the far distance (smaller one)?

## 3c. Discussion

"Frequency" means the rate of change of intensity per pixel.

Let's say you have some region in your image that changes from white to black. If it takes many pixels to undergo that change, it's low frequency. The fewer the pixels it takes to represent that intensity variation, the higher the frequency.

我們會說高頻的圖片，是比較近的圖片是因為圖片像素的變化較高，如果是低頻的圖片，像素的變化率比較低，會比較平均或是說比較模糊。

## 4. (3%) Conclusion.

這次的lab透過簡單的矩陣乘法，我們可以實作一個最基本的image filter的operator如何作用在圖片上，也透過其proj1\_test.py我們可以得到不同filter所得出的效果，除了image\_filter我們也可以知道convolution 這個operator與image\_filter兩者的不同。