

## HW04

學號:309515021 姓名:黃浩瑋

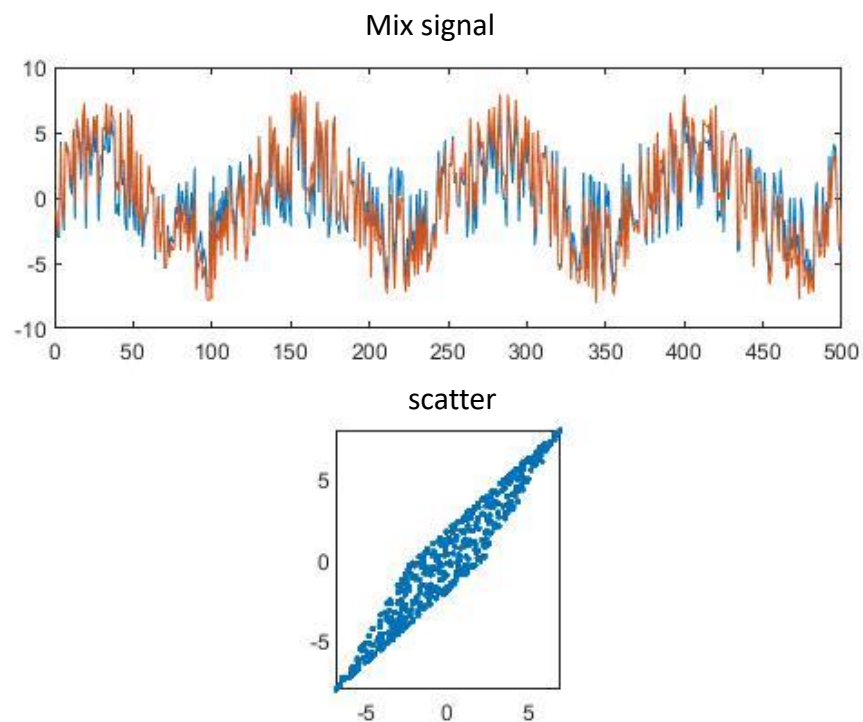
### 1. PCA

```
t = linspace(0,1,500)'; %隨機兩訊號
y1 = sin(8*pi*t);        %弦波
y2 = rand(size(t));      %像 noise 的訊號
y1 = (y1-mean(y1))/std(y1); %測量訊號 均值為 0 且標準偏差為 1
y2 = (y2-mean(y2))/std(y2);
```

```
A = 3*rand(2,2); %隨機矩陣 A
```

```
X = [y1,y2]*A; % X=As
```

```
figure
clf
subplot(2,1,1)
plot(X)
subplot(2,1,2)
plot(X(:,1),X(:,2),'.')
axis equal
axis tight
[coeff,latent,explained] = pcacov(X) %PCA 分析
```



PCA Matrix

Coeff =

0.6506	0.7594
0.7594	-0.6506

```
Command Window
>> Random_singal

Coeff =

    0.6506    0.7594
    0.7594   -0.6506
```

Principal components:

PC1 為 87.7014%

PC2 為 12.2986%

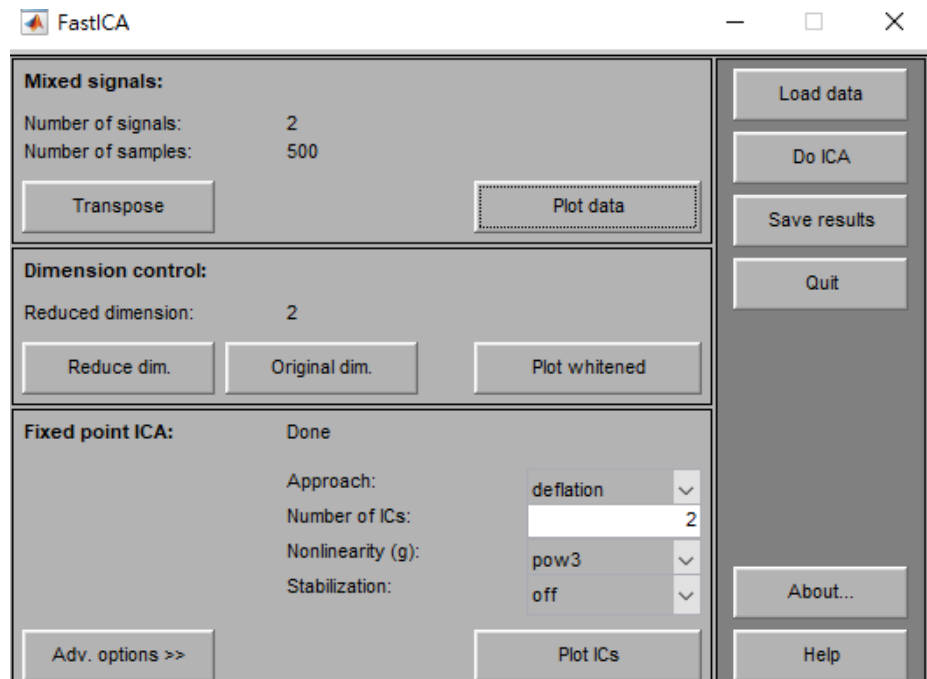
```
Command Window

explained =

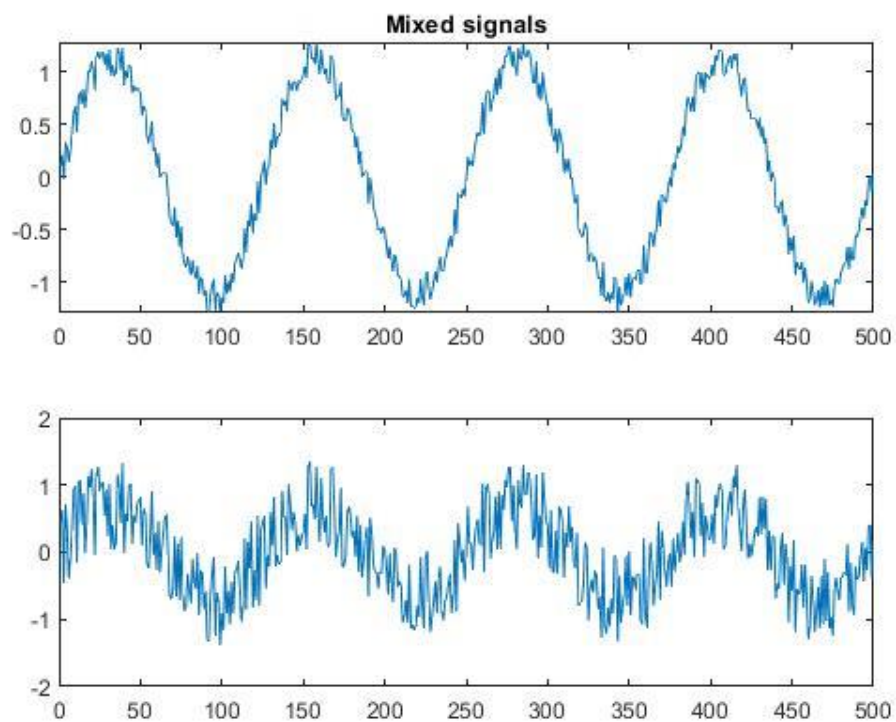
    87.7014
    12.2986
```

## 2. ICA

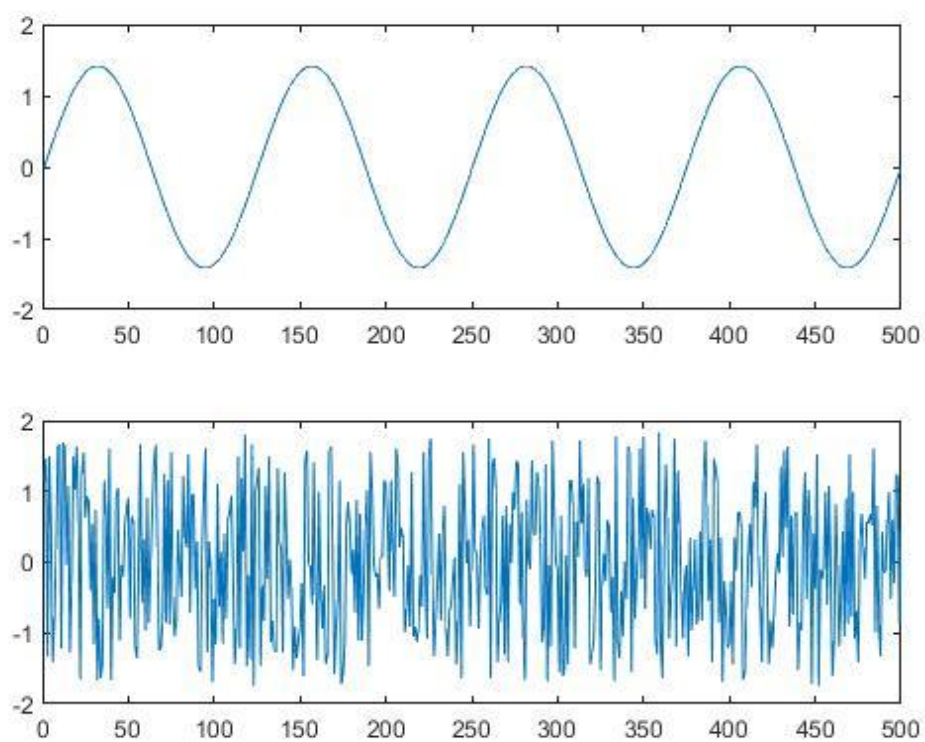
這裡我使用 FASTICA



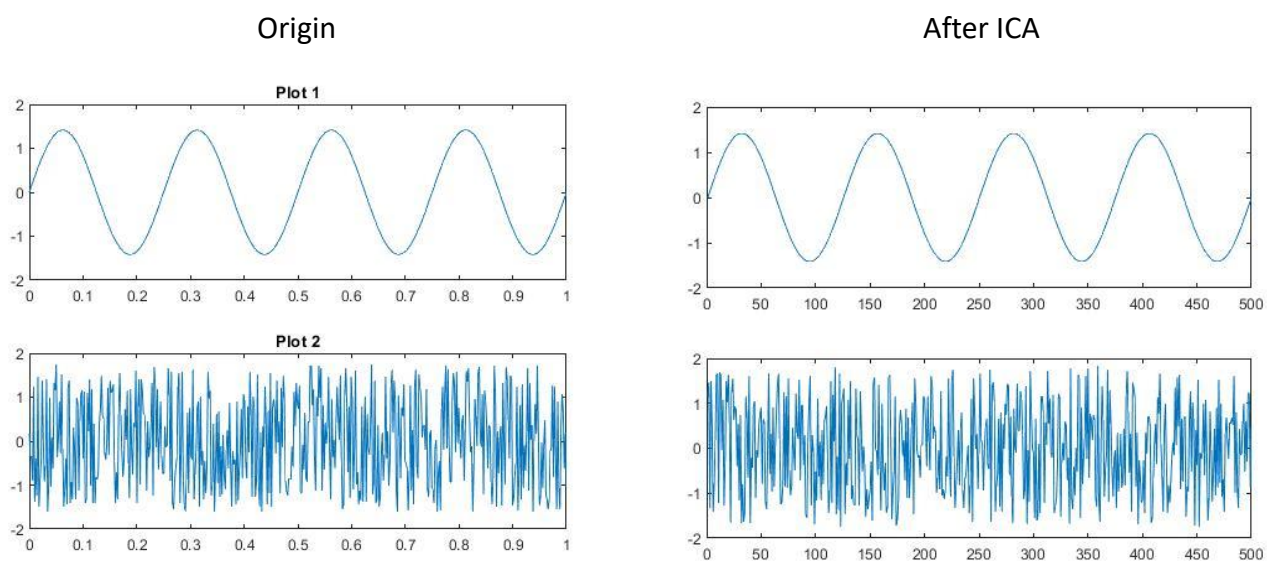
原始 Mix signal(如下圖):



經過 ICA 後可以得到兩個 independent signal:



與原訊號做比較(如下圖)，可看出基本一制:



Scatter 後:

