

結構化機器學習模型及其應用

第三次報告

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Representation

c_{11}	c_{12}	c_{21}	c_{22}	a_1	b_1	a_2	b_2
E	2	A	C	1	0	6	2
5	B	6	3	1	0	6	2

.....

a_{15}	b_{15}	a_{16}	b_{16}
4	4	E	E
4	4	E	E

Feature(x) :

$x = [a_1, b_1, \dots, a_{10}, b_{10}, a_{13}, b_{13}, \dots, a_{16}, b_{16}]$ (28 Dim) , $a_i, b_i = 0 \sim E \quad \forall i$

$x \longrightarrow [x_1, x_2, \dots, x_{111}, x_{112}]$ (112 Dim) , $x_i = 0 \text{ or } 1 \quad \forall i$

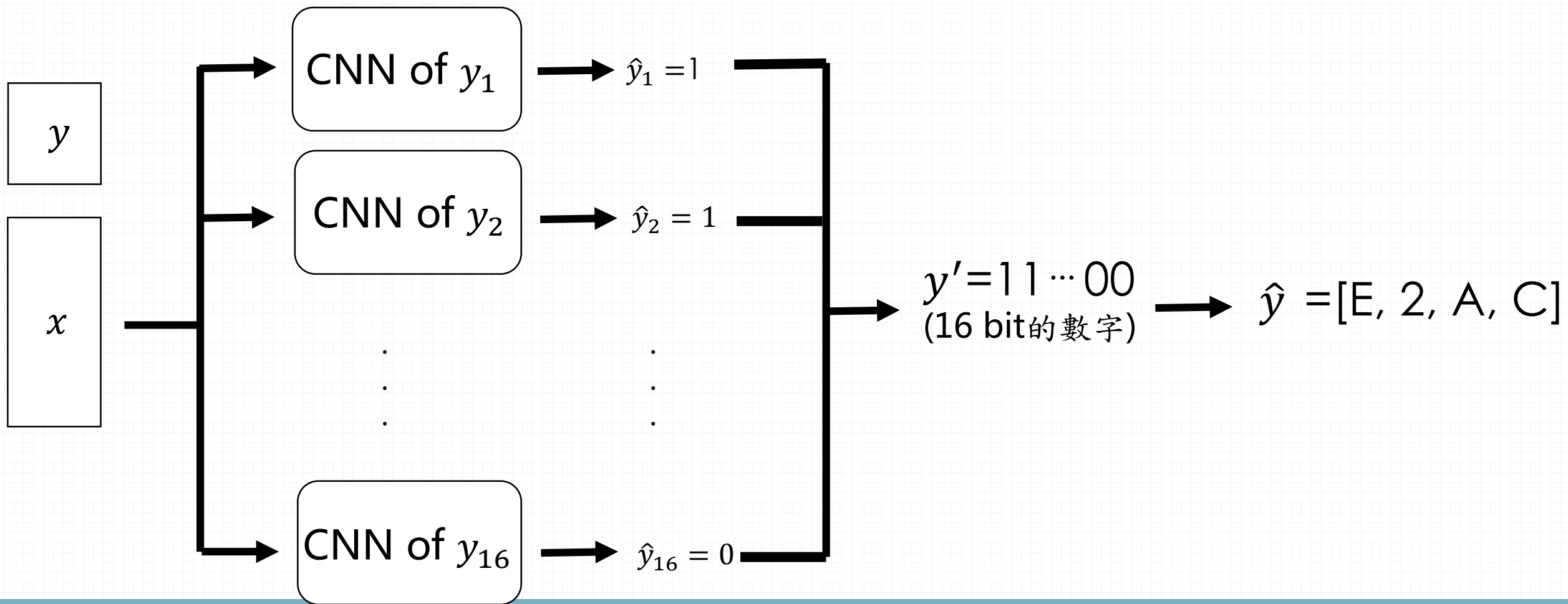
Label($y = [y_1, y_2]$) :

$y = [y_1, y_2] = [c_{11}, c_{12}, c_{21}, c_{22}] \longrightarrow y = 16 \text{ bit}(000 \dots 000 \sim 111 \dots 111)$

$y \longrightarrow (y_1, y_2, \dots, y_{15}, y_{16}) \quad y_i = 0 \text{ or } 1 \quad \forall i=1 \sim 16$

二、Model

Convolutional Neural Network(CNN) for y



三、Result

Result for Convolutional Neural Network(NN)

Train/Test: 70% / 30%

Accuracy of Total test($y = [y_1, y_2] = [c_{11}, c_{12}, c_{21}, c_{22}]$) : 0.9469

Label	Accuracy(CNN)
1 bit(y_1)	0.9999
2 bit(y_2)	0.9999
3 bit(y_3)	0.9999
4 bit(y_4)	0.9999
5 bit(y_5)	0.9999
6 bit(y_6)	0.9997
7 bit(y_7)	0.9997
8 bit(y_8)	0.9997

Label	Accuracy(CNN)
9 bit(y_9)	0.9856
10 bit(y_{10})	0.9848
11 bit(y_{11})	0.9836
12 bit(y_{12})	0.9901
13 bit(y_{13})	0.9947
14 bit(y_{14})	0.9989
15 bit(y_{15})	0.9997
16 bit(y_{16})	0.9997

≡ 、 Result

Result for Neural Network(NN)

Accuracy of Total test($y = [y_1, y_2] = [c_{11}, c_{12}, c_{21}, c_{22}]$) : 0.9237

Result for Convolutional Neural Network(NN)

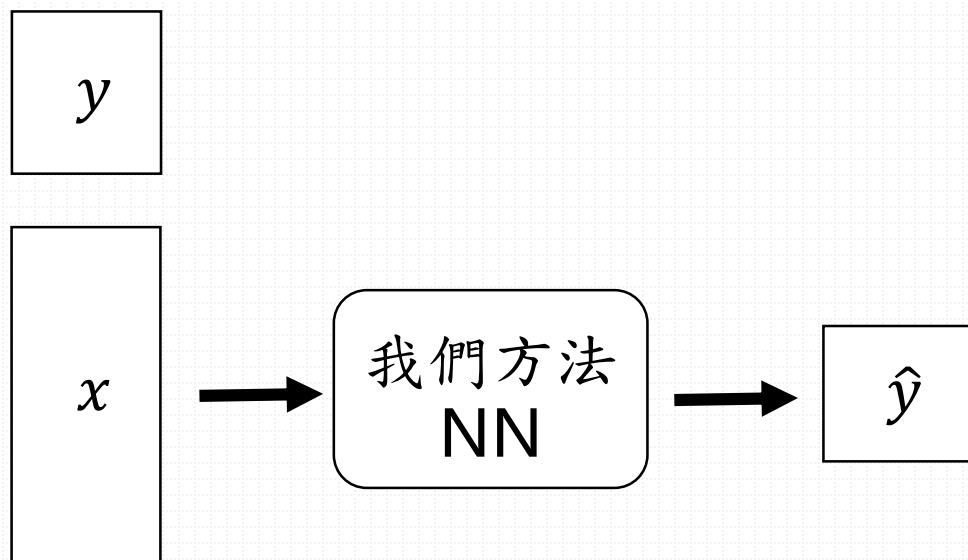
Accuracy of Total test($y = [y_1, y_2] = [c_{11}, c_{12}, c_{21}, c_{22}]$) : 0.9469

Numbers of Parameters for NN and CNN are same

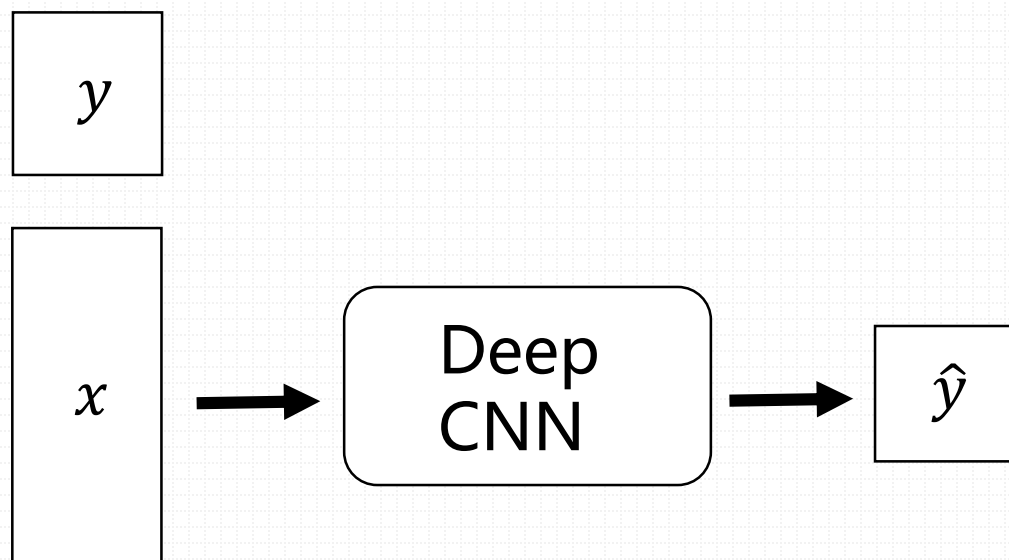
四、論文方法

目的-確認我們的方法能藉由多個電腦平行化，比使用Deep CNN所使用的訓練時間更短

(1)我們使用的方法(CNN)



(2)Deep CNN



Dataset:

超連結網址

<https://drive.google.com/drive/folders/1bjsgbmmnNmBmwltA5-QYG5Hj7RgOP-4F?usp=sharing>



THE END

感謝聆聽