Mlchip First Report

(AlexNet)
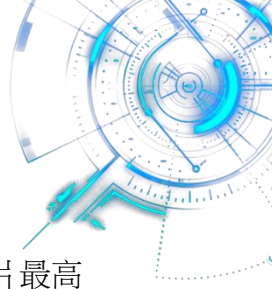
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一、Simulation results

列舉出 Value 最高的五項。狗的圖片最高分的是 golden retriever。貓的圖片最高分的是 Egyptian cat。

```
13:26 mlchip081@ee21[~/lab1]$ make
g++ -I . -I  /RAID2/COURSE/mlchip/mlchipTA01/systemc-2.3.3
,-rpath,/RAID2/COURSE/mlchip/mlchipTA01/systemc-2.3.3/lib-
./run

        SystemC 2.3.3-Accellera --- Mar  2 2024 23:27:20
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        ALL RIGHTS RESERVED
Top 1 class: golden retriever - Value: 13.4578
Top 2 class: otterhound - Value: 11.5174
Top 3 class: gibbon - Value: 10.8191
Top 4 class: cocker spaniel - Value: 10.8049
Top 5 class: Afghan hound - Value: 10.6655
13:26 mlchip081@ee21[~/lab1]$ make
g++ -I . -I  /RAID2/COURSE/mlchip/mlchipTA01/systemc-2.3.3
,-rpath,/RAID2/COURSE/mlchip/mlchipTA01/systemc-2.3.3/lib-
./run

        SystemC 2.3.3-Accellera --- Mar  2 2024 23:27:20
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        ALL RIGHTS RESERVED
Top 1 class: Egyptian cat - Value: 16.8256
Top 2 class: plastic bag - Value: 12.1464
Top 3 class: tabby - Value: 11.6603
Top 4 class: lynx - Value: 11.5326
Top 5 class: fox squirrel - Value: 11.1001
```

二、程式細節

1. Implementation approach

   藉由以下公式，推算出 padding 及 stride 的數值。

   輸出圖像的大小 (W_{out}, H_{out}) 可以通過以下公式計算：

   $$W_{out} = \frac{W_{in} - F_W + 2P}{S} + 1$$

   $$H_{out} = \frac{H_{in} - F_H + 2P}{S} + 1$$

2. Challenges faced

   圖片一般來說是 227*227*3 較為適合做 AlextNet，因此前處理先將 224*224*3 resize 成 227*227*3。實驗室同學則是採用 Zero padding 的方式。結果略有不同，但第一名的類別皆相同。

```
Top 5 predictions:
Index: 207, Class: golden retriever, Probability: 16.5945
Index: 175, Class: otterhound, Probability: 15.5697
Index: 220, Class: Sussex spaniel, Probability: 15.3619
Index: 163, Class: bloodhound, Probability: 15.0027
Index: 219, Class: cocker spaniel, Probability: 14.5932
14:04 mlchip082@ee21[~/HW1]$
```
```
Top 1 class: golden retriever - Value: 13.4578
Top 2 class: otterhound - Value: 11.5174
Top 3 class: gibbon - Value: 10.8191
Top 4 class: cocker spaniel - Value: 10.8049
Top 5 class: Afghan hound - Value: 10.6655
```

```
Top 5 predictions:
Index: 285, Class: Egyptian cat, Probability: 20.2067
Index: 281, Class: tabby, Probability: 16.1368
Index: 282, Class: tiger cat, Probability: 15.7339
Index: 287, Class: lynx, Probability: 14.7909
Index: 728, Class: plastic bag, Probability: 14.4119
14:02 mlchip082@ee21[~/HW1]$
```
```
Top 1 class: Egyptian cat - Value: 16.8256
Top 2 class: plastic bag - Value: 12.1464
Top 3 class: tabby - Value: 11.6603
Top 4 class: lynx - Value: 11.5326
Top 5 class: fox squirrel - Value: 11.1001
```