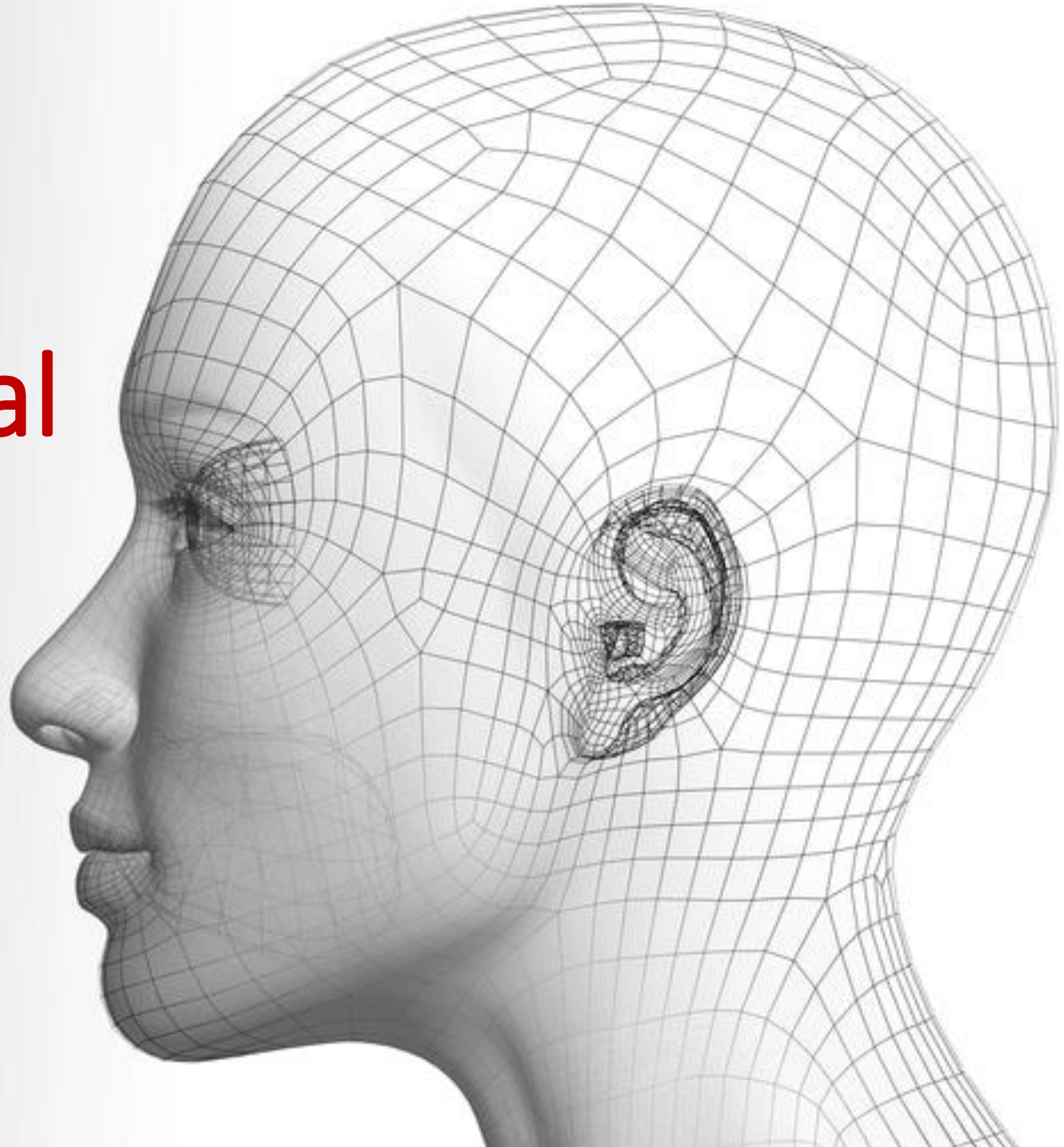
Tutorial 7 Convolutional Neural Networks II

Chen Change Loy (Cavan)

https://www.mmlab-ntu.com/person/ccloy/

https://twitter.com/ccloy



Question 1

Figure Q1 depicts a block that consists of three convolutional layers. The input volume has a size of $256 \times 32 \times 32$ and the second layer has 32 convolution filters each with a size of $64 \times 3 \times 3$, stride = 1 and padding = 1.

Provide the values of n_1, d_1, F_1, n_2, d_2, and F_2 to form a valid block. Explain your design.

(2022 Sem 1 exam: 8 marks)

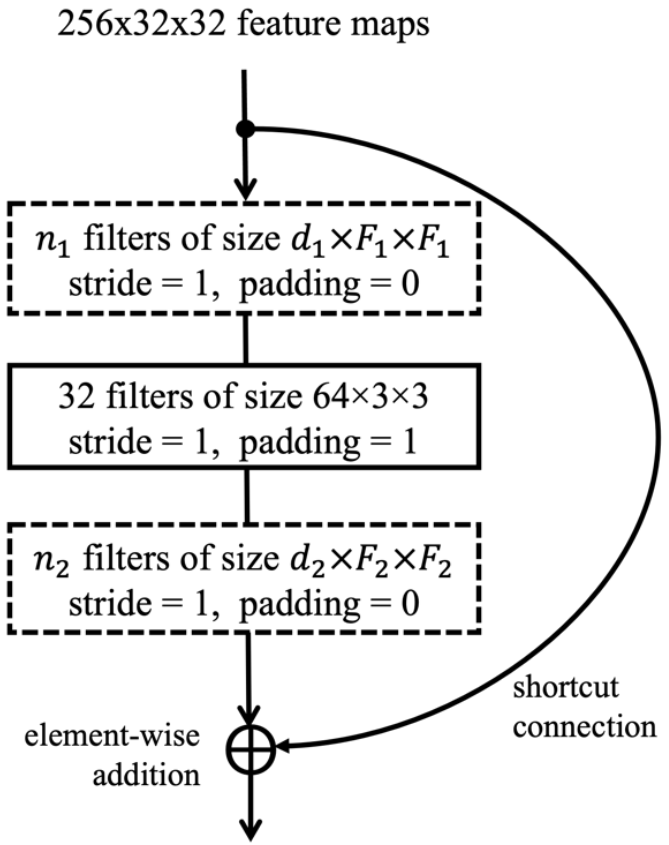


Figure Q1

Question 1

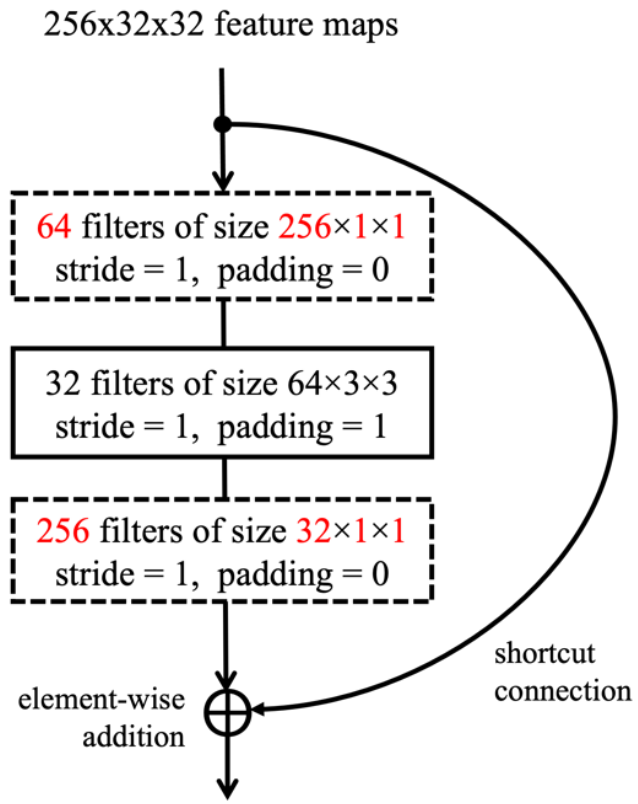
Answer:

$n_1 = 64, d_1 = 256, F_1 = 1$

$n_2 = 256, d_2 = 32, F_2 = 1$

To form a valid block, the size the of output volume at the residual branch has to be the same size as the input volume, which is $256 \times 32 \times 32$, such that element-wise addition can be performed, thus $n_2 = 256$ and 1×1 is chosen to keep the spatial resolution.

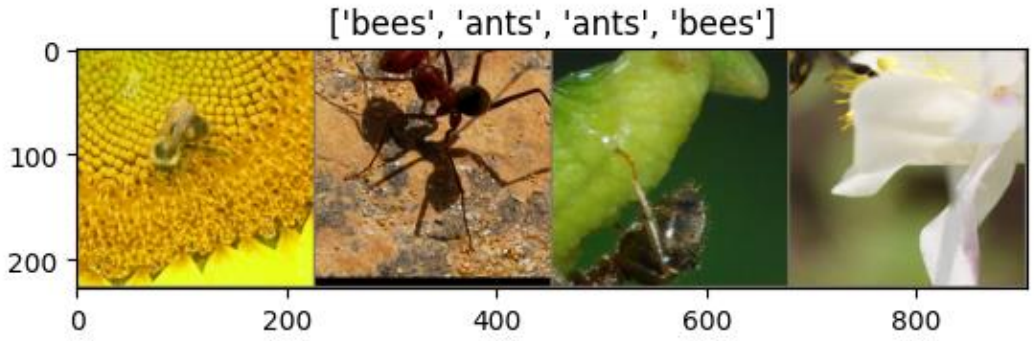
The values of d_1 and d_2 are chosen to match the depth of their corresponding input. n_1 is chosen to match the filter size of the second layer.



Question 2

Study and try the tutorial t7q2.ipynb on transfer learning. In particular,

- Understand how to data augmentation is performed
- Review the transfer learning steps
- Try the code to perform transfer learning on the classification of bees vs. ants



Check the code for more details

t7q2.ipynb