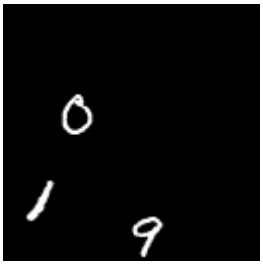
機器學習實務與應用

Homework #6
Due 2024 May 29 11:00PM

(一)The enclosed dataset ***HW6_train.zip*** contains the training data of handwritten digit images. Different from homework 2, each image now may contain multiple digits. In this assignment, you should design an object prediction system based on the deep neural network, such that it can predict the class and the (x,y) coordinate of the upper left corner of the object's bounding box for those digits existing in the test images ***HW6_test.zip***. You ***cannot*** use the existing ***Yolo*** package to do this homework.

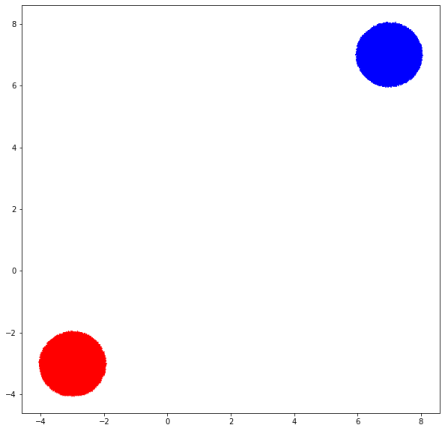


You should generate a csv file of your prediction results. The format is shown as below:

	A	B	C	D
1	IMAGE_index	class	x	y
2	0000002	0	0.367	0.437
3	0000002	8	0.335	0.67
4	0000002	8	0.718	0.484
5	0000062	1	0.483	0.621
6	0000062	6	0.483	0.621
7	…	…	…	…

Note: The dataset used in the homework can be downloaded from：
https://drive.google.com/drive/folders/1i2K6YVoNwS_vTLlyqbQrmev3Gah3h5qr?usp=sharing

(二) Suppose we have some 2-D data distributed within a circle centered around (7,7) and (-3,-3) respectively as shown in the following figure



(a) Use an ordinary GAN, WGAN, or WGAN-GP to generate data similar to the real data distribution. You should generate 50 data points and plot these points in a figure.

(b) Use Info-GAN with an additional category input to generate data. You should control which group of data you want to generate.