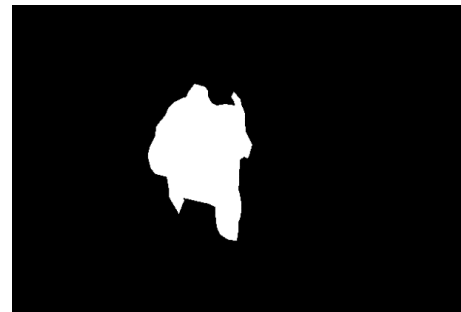
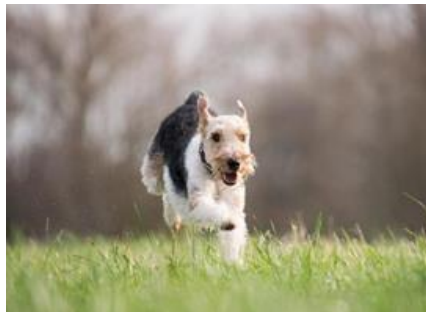


Homework 2

Salient Object Detection

Due 4/30 PM3:30





Part I: Create your own dataset.

- 1 Take 4 photo images (2 indoor and 2 outdoor scenes) and 2 drawing images.
 - Image format: color JPG, resolution: 960x640
- 2 Mark the salient objects (視覺上吸引注意力的物體) in the images prepared in Question 1; the salient objects should be marked in white and the others in black. These will be the ground truth files.
 - 2-1. Save the file in 8-bit grayscale, PNG format, black value 0, white: 255.
 - 2-1-1. You may use “LabelMe” to complete this homework question
 - 2-1-2. Besides those PNG files, you shall write down/record how you generate the ground truth files. (心得報告)



Part II: Learn to use SuperCNN to detect salient objects

- Learn to train a modified SuperCNN neural network
(SuperCNN Codes: https://github.com/workaholab/easyExample/tree/master/SuperCNN_modified)
(paper: [https://github.com/yash0307/SuperCNN/blob/master/final-report/learning-salient-objects%20\(1\).pdf](https://github.com/yash0307/SuperCNN/blob/master/final-report/learning-salient-objects%20(1).pdf))
- 3. Training SuperCNN network
 - 3-1. Choose a dataset for image-based salient object detection.
 - e.g. MSRA10K (http://mftp.mmcheng.net/Data/MSRA10K_Imgs_GT.zip)
 - 3-2. Use 2000 different pairs of patterns (image and salient object mask) as SuperCNN training data.
 - 3-3. Train the SuperCNN model parameters.
 - 3-3-1. Generate the superpixel segmentation based on the images from 3-2. You shall use Matlab code ([training_slic_seg_label.m](#)) for this assignment.
 - 3-3-2. Execute the ([train_superCNN.py](#)) to train and obtain the parameters of SuperCNN.
 - 3-3-3. Hand in the 14 model parameter files in h5 format. (繳交訓練時所產生的參數檔案)
 - 3-3-4. Record how much time does it take to finish the training process; also, record the spec of your machine. (報告內需紀錄訓練所需時間與機器規格)



Part II: Learn to use SuperCNN to detect salient objects

- 4. Detect salient objects using the trained SuperCNN
 - 4-1. Take the images and the corresponding groundtruth files created by you (in Part I) as testing data.
 - 4-2. Detect the salient objects with the trained SuperCNN network.
 - 4-2-1. Generate the superpixel segmentation based on the images from Question 1.
 - 4-2-2. Using the testing code ([test_superCNN.py](#)) to test the trained SuperCNN.
 - Model parameters of SuperCNN which are trained in step 3-3-3 is required to execute the testing code.
 - 4-3. Hand in the matrix file (Test_out.mat) that will be generated after testing process. (繳交測試之後產生的檔案)
 - 4-4. Record the accuracy values (range [0,1], close to 1 is better) from evaluation result process in the report. (紀錄所提供的accuracy結果)
 - 4-5. Make a report about what you learn in this homework and pro/con of the method. (心得報告，包含學習心得，方法優缺點分析)



Hand-in files

- Part I: Create your own dataset.
 - (1). (15%) Created images: jpg format, RGB mode (24-bits), size: 960*640
 - Images: HW2_indoor_#, HW2_outdoor_#, HW2_artificial_# {.jpg}
 - (2) (15%) Salient object groundtruth images: png format, grayscale (8-bits), size is same as the original image you create.
 - Groundtruth: HW2_indoor_#_GT/HW2_outdoor_#_GT/HW2_artificial_#_GT {.png}
- Part II: Learn to use SuperCNN to detect salient objects
 - (3) (15%) Parameter files you obtain: (3-3-3)
 - Your training model parameter files (.h5 files): model_{1...14}.h5
 - (4) (15%) Resulting file of the salient object detection: (4-3)
 - output mat file: Test_out_{HW2_{type}_#}.mat for each pairs of testing files {type}={indoor, outdoor, artificial}
 - (40%) A report (at least 1000 words) (心得報告)
 - The report file name: HW2_{name}_{studentID} {.pdf or .docx} (file format may opened with MS Word or PDF reader.)
- (X %) Optional bonus: There are many other salient object detection neural networks available. You are encouraged to find and try on your own. It is also encouraged for you to come out with your own ideas.
- Please zip all the files :
 - HW2_{name}_{studentID} {.zip or the format can be extracted by 7zip}

