**CSE47201 Computer Vision Programming Assignment 3 [100 points]**

**Deadline : until Dec. 21 23:59**

* Download the training/testing facial database using the link below, respectively:

<https://drive.google.com/drive/folders/1AvucZfPNgUQ8ozK7ps0fbdLYi7ROvoSe?usp=sharing>

* There are 4,500 training images (\*.jpg) and their annotations (\*.png) in the `train\_img’ and `train\_label’ folder; while there are 500 testing images (\*.jpg) and their annotations (\*.png) in the `test\_img’ and `test\_label’ folder.
* Use the training database when training your model (in Problem 2) while using the testing database when evaluating your model (in Problem 1, 3).
* Download the network architecture (model.py), main code (main.py) and weight file(\*.pth) contained in the link below:

<https://drive.google.com/drive/folders/1B2sCQhKlyrkeIQv1kLP3H71LMAzQfR3H?usp=sharing>

* If you have any questions, please post it on the blackboard/discussion/‘assignment 3’ board.
* You can write reports either in Korean or English.

1. [20 points] We provided the `Tester’ class that initializes the hand pose estimation network with the weights `pretrained\_weight.pth’ provided.

1) Run the main.py using the colab code below and visualize the color-coded segmentation masks for the images `0.jpg’, `10.jpg’, `100.jpg’, `103.jpg’, `109.jpg’, `162.jpg’ contained in the test folder. (If successfully managed and executed, color-coded segmentation masks will be automatically generated in the `/content/test\_color\_mask’ folder).

| # First, make sure \*.py are uploaded in the colab local path (‘/content/’).  # Set the proper data and model paths in the main.py  # Execute below codes:  from google.colab import drive  drive.mount('/content/drive')  !python main.py |
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Below are examples for human images and corresponding color-coded segmentation masks for the visualization having 3 classes (Hair: green, RGB=(76, 153, 0), Face: red, RGB=(204, 0, 0), Background: black, RGB=(0,0,0) ):

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1. [50 points] Implement the `train’ method of the `Trainer’ class for training your own segmentation mask estimator (ie. SegNet):

trainer = Trainer(epochs, batchSize, learningRate)

trainer.train()

* 1. You may use the cross-entropy loss to make the predicted segmentation mask close to the ground-truth segmentation mask.
  2. Please do not change the structure of the segmentation mask estimator (ie. SegNet) in model.py.

1. [20 points] Train your own segmentation mask estimator using the code in Problem 2 and run your trained network on the 500 testing images again and visualize the obtained results for the `0.jpg’, `10.jpg’, `100.jpg’, `103.jpg’, `109.jpg’, `162.jpg’ contained in the test folder. (To get the full score, your results need to have reasonable quality to capture human faces. Please properly tune the training stage in Problem 2.)
2. [10 points] Note and apply the below details.
   1. Send all files(.zip) via **Blackboard**.
   2. In **2022xxxx\_seungryulbaek\_cv\_ass3.zip** file, you need to submit main.py and report.pdf (or report.docx) including image visualizations.
   3. Also, you need to attach your fine-tuned weights obtained from Problem 2 in the name with `my\_own\_weight.pth’.  
       <Example>

2022xxxx\_seungryulbaek\_cv\_ass3.zip

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--- my\_own\_weight.pth

|

--- main.py

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--- report.pdf or .docx

|

|  
--- etc.

\* IPYNB->PDF Tool: <https://htmtopdf.herokuapp.com/ipynbviewer/>

* 1. Code should have some **comments** to increase the readability.

| **<Tip>**  Maximum keeping time for one session in the CoLab is 12 hours when you use GPU mode, but if you remain in your CoLab session without typing anything over 90 mins, the session would be automatically shut down. So, please refer below links to prevent it.  <https://naenjun.tistory.com/18>  <https://stackoverflow.com/questions/57113226/how-to-prevent-google-colab-from-disconnecting> |
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