

CSE 673 Assignment 2- Part 2: Semantic Segmentation

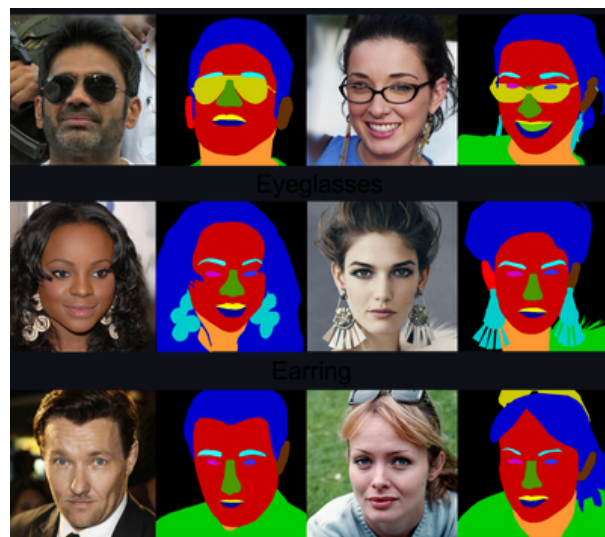
The objective of this part of the assignment is to get some experience with creating a semantic segmentation pipeline. The primary goal is to use any UNet or Deep Lab-based semantic segmentation models to perform the segmentation of facial attributes.

Datasets:

- CelebAMask-HQ:
 - It is a large-scale face image dataset that has **30,000** high-resolution face images selected from the CelebA dataset by following CelebA-HQ. Each image has a segmentation mask of facial attributes corresponding to CelebA [Link](#)

Task and Evaluation:

- Task: Train a custom UNet based or Deep Lab-based segmentation network of your choice on the CelebAMask-HQ dataset and report the performance.
 - You can make use of any open source model that implements UNet or Deep Lab
 - Proper use of dataset generators/data loaders, to only load images batch by batch is a must (which should be written by you)
 - Evaluate the performance of the model using standard segmentation metrics like mean IOU [IOU in segmentation is calculated as $\text{true_positive} / (\text{true_positive} + \text{false_positive} + \text{false_negative})$, averaged for each class]
 - Create a grid like the one shown below, after passing evaluation samples through the model.



- Evaluation
 - Custom Dataloader/generators - 10 points
 - Training the DeepLab/UNet model - 10 points
 - Performance measure and Visualization - 10 points
 - Bonus: - If your group finishes with accuracy that is in the top 3 of the class - 5 points

Submission Instructions

You will submit Assignment2_part2.zip or Assignment2_part2.tar.gz, a compressed archive file containing the following files:

- Python code for the tasks (training and evaluation code)
- The best model, that gave the performance that you have reported (for each of the tasks)
- Report

In this part of the assignment, you are not expected to code up the Deep Lab-based or UNet based model. Use any open source network implementations of the above-mentioned approaches. The amount of code you need to write is limited to the data loader/generator and visualization. Emphasis is given to taking an open-source model and quickly creating a pipeline.

Submission is due 11/10/2021, Wednesday, 11:59 PM EST. Please use the submit_cse673 script in Timberlake to submit your assignment.