Multimodal Data Mining

BME 6938 Section 075C

Mini-Project 1

Due Date: Feb. 12, 2019 11:50PM

- Please turn your homework code through a GitHub Repository (see below).
- Late submission will get 50% points off per day.
- Do not change the repository after the due date; your homework will not be graded.
- 20 points in total

Write your code in using Python Jupyter Notebook or MATLAB executable notebook in .mlx format.

1. Implement K-means and K-shift algorithms from scratch using MATLAB or Python. Do not use the existing functions for k-means and k-shift directly. (5 pts)

2. Find a (biomedical preferred) dataset with ground truth segmentation of at least 100 images. Apply your implemented algorithms on the data. (5 pts)
e.g. http://medicaldecathlon.com/
https://www5.cs.fau.de/research/data/fundus-images/

3. Optimize your algorithms to improve the performance and explain why each step is needed. Use markdown cells of your notebook for explanation. (5 pts)

4. Report in both tables and visual results the average DICE coefficient and computational time for both algorithms' on the data. Also show examples of good segmentation and bad segmentation by both algorithms. (5 pts)

5. Create a GitHub repository and share your code via GitHub with the instructor by submitting the link on Canvas.