

## Assignment 2

Assignment due: **03/08/2023 11:59 PM EST**

Late submission due: 03/15/2023 11:59 PM EST with 10% grade penalty

Submissions after 03/15/2023 11:59 PM EST will not be accepted

Submission format: please submit your codes with a readme file for Task 2 and a report in .pdf for all tasks. Do not include the dataset in your code submission. You are encouraged to submit a **github repo link** which includes all your code.

### Task 1 : Paper Reading - 30%

Read the paper titled ‘Sphereface: Deep hypersphere embedding for face recognition.’ Answer the following questions:

- What are the contributions of this paper? - 10%
- Illustrate the three properties of the proposed A-Softmax. - 10%
- What is the evaluative metric used for the LFW dataset? How does it calculate? - 10%

### Task 2 : Sphereface Implementation - 70%

Please follow the paper and implement SphereFace by yourself. Implement the face recognition model in a 4-layer CNN from Table 2 in the paper. Train and test the model on the LFW dataset using the split `pairsDevTrain.txt` and `pairsDevTest.txt` from <http://vis-www.cs.umass.edu/lfw/index.html>. Report the accuracy you get.

You may refer to any open-source code related to SphereFace. If the training is too slow on your laptop, consider using some GPU resources from Brandeis or a free online platform.

**Grading criteria:** 1. Data loading and augmentation (for augmentation see page 6 paragraph ‘Training Data’) - 10%; 2. Design of neural networks - 15%; 3. Loss function - 10%; 4. Training - 15%; 5. Testing and results - 10%; 6. Code format (separate python files, use classes properly, etc.) - 10%.