ENSE 885AU Deep Learning
Project Proposal
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Problem to be solved:
Although image recognition is widely used in the field of machine learning, it is useful to practice on it. The problem I propose to solve is to extract or recognize certain facial attributes through the use of image recognition. The face attributes include but are not limited to 5_o_Clock_Shadow, Arched_Eybrows, Attractiveness, Bags_Under_Eyes, etc.

Proposed dataset:
Kaggle dataset: CelebFaces Attributes (CelebA) Dataset
This dataset consists of one image directory with four CSV files containing different information.

- listevalpartition.csv: Recommended partitioning of images into training, validation, testing sets.
- listbboxceleba.csv: Bounding box information for each image.
- listlandmarksalign_celeba.csv: Image landmarks and their respective coordinates. There are 5 landmarks: left eye, right eye, nose, left mouth, right mouth
- listattrceleba.csv: Attribute labels for each image. There are 40 attributes.

Project technical proposal:
There are many difficulties in this project, so I decided to divide it into several stages. The proposed minimum work to be done at the end of the semester is to complete the second stage, which is to detect the faces of the images. If time and knowledge permit, the third and fourth stages will be used for advanced work.

- Stage_0: Image import and CSV data extraction
- Stage_1: Split data with the help of recommended image partitioning CSV file.
- Stage_2: Facial recognition by trying to detect the facial bounding box upper left coordinate with box length and box width. Using the bounding box CSV file.
- Stage_3: Extract facial area off an image, trying to detect the location of eyes, nose, and left-right mouth.Using the landmark CSV file.
- Stage_4: Learning the 40 facial attributes and making detection on test images. Using attribute CSV file.