ASSIGNMENT – II –

Primary Focus: Implementation of local search algorithms for feature subset selection

Allied areas: machine learning algorithms (NN, SVM, RF), Computer vision (Face recognition, emotion recognition)

Group Assignment – A Team can consist of **at most 8 members**.

Use open face toolkit (https://cmusatyalab.github.io/openface/)

VERSION 1

Use CK+ dataset for annotated images. (Zipped and shared in 'AI class lecture video' folder)
(https://drive.google.com/file/d/1MGWKN8_95Y_yk0qJ92Humyu_5ZsxI8v0/view?usp=sharing)

Feature subset selection for different emotions:

- ➢ Find out Which subset of features will best identify happy faces?
  Which subset of features will best identify angry faces?...
- ➢ Each group choose and work on one Local search algorithm (GA, PSO, any variants) and one specific emotion. {Anger, Surprise, Fear, Contempt, Sadness, Happiness, Disgust}
- ➢ Show how by using different operators and adjusting the parameters of the search algorithm, brings about a difference in the Space and Time of the search process, and also the Quality of the search solution.
- ➢ Train and validate the model using CK+ dataset.
- ➢ Take masked and unmasked photos of your team and share the annotated image files of different emotions in a shared folder.
- ➢ Test the model with the images of your team members and classmates.

VERSION 2

Download the CK+ dataset for annotated images. (Zipped and shared in AI class lecture video folder)
(https://drive.google.com/file/d/1MGWKN8_95Y_yk0qJ92Humyu_5ZsxI8v0/view?usp=sharing)

MASK THE IMAGES IN THE DATASET

Use this library for digitally masking the images: https://github.com/Prodesire/face-mask

If needed, you can write a simple bash script to run the library commands over all the images in the CK+ folder on your system, since there are 981 images and it's difficult to input each image manually.

Feature subset selection for different emotions:

- ➢ Find out Which subset of features will best identify happy faces?
  Which subset of features will best identify angry faces?...
- ➢ Each group choose and work on one Local search algorithm (GA, PSO, any variants) and one specific emotion. {Anger, Surprise, Fear, Contempt, Sadness, Happiness, Disgust}
- ➢ Show how by using different operators and adjusting the parameters of the search algorithm, brings about a difference in the Space and Time of the search process, and also the Quality of the search solution.
- ➢ Train and validate the model using digitally masked CK+ dataset.
- ➢ Take masked and unmasked photos of your team and share the annotated image files of different emotions in a shared folder.
- ➢ Test the model with the masked images of your team members and classmates.

No diagrams/theoretical reports. Present only the code and demo with the results in a document/spreadsheet using graphs/tables during the Viva voce.

Suggested timeline of activities:

05 Oct	08 Oct	Download and get used with openface toolkit
09 Oct	11 Oct	Try Openface with masked and unmasked images of your team mates
12 Oct	16 Oct	Decide on Fitness function: Get to know at least one machine learning algorithm (NN, SVM, RF)
17 Oct	19 Oct	Design the operators and parameters of the chosen search algorithm.
20 Oct	23 Oct	Implement Local Search for Feature subset selection.
26 Oct	29 Oct	Try out all possibilities (changing operators, adjusting parameters) and ensure to make note of all the results (document/spreadsheet).
30 Oct	02 Nov	As a group, try to observe, understand and correlate all concepts discussed in the class with the experiment

Important Dates

Assignment Start Date: 05 Oct 2020;

Assignment End Dates: Viva and demo: 03 Nov to 06 Nov 2020

Evaluation Rubrics:

Correctness in usage of algorithms: [10 marks]
Elegance and creativity: [5 marks]
Viva voce on search algorithms, rule-based agents, learning agents. (Basics of ML desirable) [5 marks]