**Due Date: 25/01/24**

**SIR SYED UNIVERSITY OF ENGINEERING & TECHNOLOGY**

**COMPUTER SCIENCE & INFORMATION TECHNOLOGY DEPARTMENT**

**Fall 2023**

**Parallel & Distributed Computing (CS-429)**

**Assignment # 3**

Semester: 8th Batch: 2020

Announced Date: 24/01/24 Due Date:

Total Marks: 04 Marks Obtained:

Instructor Name: Asif Raza

| **CLO #** | **Course Learning Outcomes (CLOs)** | **PLO Mapping** | **Bloom’s Taxonomy** |
| --- | --- | --- | --- |
| CLO 3 | **Classify** the following program using GPU utilization in python. | PLO\_1  (Academic Education) | C2  (**Predict**) |

Q1. **Classify** the following program using GPU utilization in python by using your existing data set with **Fuzzy Logic**. Assignment must contain/cover the following points.

**Note:** You have already given a dataset in **ASSIGNMENT 1** for simulation. In **ASSIGNMENT 1** you have already designed a **GPU based model** in Deep learning. In this assignment you have to classify your model based on **Fuzzy Logic** of your own choice**.** You may use any variant of Fuzzy Logic but **NO** group should practice same **Fuzzy Logic** **variant** in same class.

1. Abstract (450 words) one paragraph
2. Detail of dataset (450 words) one paragraph
3. Short detail (450 words) of types of PSO **Fuzzy Logic** **variant** that you have used in program.
4. Program must use auto split function to split dataset into 70, 15, and 15 (Training, Testing, and validation)
5. Precision, Recall, F1-Score, True Positives, False positives, True Negatives, False Negatives
6. Plot the training and validation accuracy graph & Plot the training and validation loss graph.
7. Plot the confusion matrix for the training and Validation set.
8. Create a line plot graph for the number of images per class
9. Calculate ROC curves, AUC, and error rates for each class
10. Calculate image counts graph/Number of images for each process e.g. testing, train, and validation.

**You may use any Fuzzy Logic variant from the following list.**

1. Classical Fuzzy Logic (CF)

2. Type-1 Fuzzy Logic Systems (T1FLS)

3. Interval Type-2 Fuzzy Logic Systems (IT2FLS)

4. General Type-2 Fuzzy Logic Systems (GT2FLS):

5. Adaptive Fuzzy Systems:

6. Evolutionary Fuzzy Systems:

7. Neuro-Fuzzy Systems:

8. Fuzzy Control Systems:

9. Fuzzy Decision Support Systems (FDSS):

10. Fuzzy Expert Systems:

11. Fuzzy Cognitive Maps (FCM)

12. Fuzzy Petri Nets.

13. Fuzzy Rule-Based Systems:

14. Fuzzy Inference Systems (FIS):

15. Hybrid Fuzzy Systems

**----THE END----**