**Due Date: 19/01/24**

**SIR SYED UNIVERSITY OF ENGINEERING & TECHNOLOGY**

**COMPUTER SCIENCE & INFORMATION TECHNOLOGY DEPARTMENT**

**Fall 2023**

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

**Assignment # 2**

Semester: Batch:

Announced Date: Due Date:

Total Marks: Marks Obtained:

Instructor Name:

| **CLO #** | **Course Learning Outcomes (CLOs)** | **PLO Mapping** | **Bloom’s Taxonomy** |
| --- | --- | --- | --- |
| CLO 2 | **Predict** the following program using GPU utilization in python. | PLO\_1  (Academic Education) | C2  (**Predict**) |

Q1. **Predict** the following program using GPU utilization in python by using your existing Model with any PSO variant (Hybrid Model). 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 by using Built in optimizer. In this assignment you have to combine your existing simulation model with **PSO optimization** to make your existing model as **Hybrid optimized model**. You may use any **PSO variant as mentioned below** but **NO** group should practice same PSO variant in same section.

1-Abstract (450 words) one paragraph

2-Detail of dataset (450 words) one paragraph

3-Short detail (450 words) of **type of PSO variant** 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-Base model e.g. VGG, Inception + Optimizer e.g. Adam, RMS prop) **(as per your choice)**

6-Precision, Recall, F1-Score, True Positives, False positives, True Negatives, False Negatives

7- Plot the training and validation accuracy graph & Plot the training and validation loss graph.

8- Plot the confusion matrix for the training and Validation set.

9- Create a line plot graph for the number of images per class

10- Calculate ROC curves, AUC, and error rates for each class

11- Calculate image counts graph/Number of images for each process e.g. testing, train, and validation.

**You may use any PSO variant from the following list.**

1. Global Best PSO (GB-PSO):
2. Local Best PSO (LB-PSO).
3. Fully Informed PSO (FIPS
4. Ring PSO
5. Clan-Based PSO.
6. Adaptive PSO
7. Constriction Coefficient PSO
8. Chaotic PSO
9. Dynamic PSO
10. Multi-objective PSO (MOPSO).
11. Hybrid PSO.
12. Self-Adaptive PSO.
13. Symbiotic PSO.
14. PSO with Differential Evolution (PSO-DE)

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