**ENGR 1330 – Computational Thinking with Data Science**

**Final Project: Image Classification**

**Objective:**

The MNIST library contains a large number of images showing handwritten digits. You want to design an image recognition / classification system that recognized which digit is shown in a given figure. For this task, you split the images in the database into two groups: those used for training and those used for testing.

**Tasks:**

Literature Research:

Learn more about image classification. How is this task typically solved? Take into consideration the type of images you deal with in this project.

Training Algorithm:

Design a program that uses the training images and uses them to derive classification criteria for the images in order to automatically recognize the digit shown.

Testing:

Evaluate the performance of your image classifier using images that were not part of the training set. Calculate the error rate of your image classifier.

**Deliverables:**

Part 1 (due November 24):

A report that briefly describes how to classify images and how you plan to solve the tasks of creating an image classification algorithm. You need to break down each task into manageable subtasks and describe how you intend to solve the subtasks and how you will test each task. You also need to address the responsibilities of each team member for tasks completed and tasks to be completed until the end of the semester.

Your report should be limited to 4 pages, 12 pt font size, double linespacing. You need to reference all sources you used.

Part 2 (due on Final Exam day):

1. A well-documented Python implementation for the classification algorithm.
2. A demonstration of correct performance or a description of problems that you were not able to solve.
3. A video (up to 5 minutes) in which you explain how you solved the problem and how you worked as a team.