CSC3034 Computational Intelligence

Assignment 2

August 2020

1 Mark contribution

This assignment contributes 15% of the 100% of this course.

2 Logistics

2.1 Group

You will be fulfilling this assignment in groups of 3 to 5 members.

2.2 Submission

You are required to submit on MS Teams by **25 November 2020** 5 p.m. (penalty applies for submission later than 6 p.m.)

Your submission will be a report (`report.pdf`) and a zipped file (`.zip`) containing other relevant files.

3 Instructions

The task of this assignment is to first, construct a neural network on a real-world dataset, and second, discuss how you may apply two types of hybrid intelligent systems as modification to this neural network with the dataset.

1. Choose a real-world dataset that is available online. You can obtain your dataset from Kaggle, UCI Machine Learning Repository, or other sources that you can find.
2. Understand the dataset.
3. Identify the purpose of applying a neural network on the dataset.
4. Discuss the neural network architecture to be constructed.
5. Construct, train, and test the neural network on the dataset.
6. Discuss the results.
7. Select two types of hybrid intelligent systems.
8. Discuss the purpose of modifying the neural network to be the hybrid intelligent systems.
9. Describe how you would implement the hybrid intelligent systems.

4 Report requirements

Your report should include but not limited to

1. the source of the dataset,
2. the description of the dataset,
3. the purpose of applying a neural network (what do you want to achieve with a neural network?),

4. the architecture of the neural network (how many layers of neurons you are using? Are you using a feedforward or a recurrent?),
5. the justification on the architecture (why do you choose the different parameters of the architecture?),
6. the implementation of the training of the neural network (how do you split the data? how do you determine the stopping criteria?),
7. the discussion on the results (what do the results tell you about the neural network?)
8. the two types of hybrid intelligent systems that you have selected as modification to the neural network,
9. the purpose of the modification with the hybrid intelligent systems (what can the hybrid systems do that the neural network cannot?), and
10. the description on how the hybrid intelligent systems are applied in the dataset.

Example questions are provided to help you to decide what to include in the report. They are not exhaustive and should not limit your content.

5 Marks distribution

Criteria		**%**
Content (correctness and soundness)		60
- neural network construction	15	
- neural network results	15	
- hybrid intelligent system 1	15	
- hybrid intelligent system 2	15	
Continuity		20
Report presentation (format, etc.)		20
		100