INT301 Assessment 2: Final Assessment Task

Contribution to overall module assessment	**85%**
Submission deadline	**Friday, Jan 15, 2021 (18:00)**

1. Assessment Task (80 marks)

In this assessment, you are to implement several algorithms to classify the characters segmented from the license plates of automobiles using MATLAB. The raw data are provided in ass2data.zip. Be sure to design your program in a general, well-structured fashion, and document the code appropriately.

(1) Implement two RBF (radial basis function) networks for the task, with RBF centres obtained from two unsupervised learning: k-means clustering and SOM (self-organizing map). In the following, RBF1 denotes the model with centers from k-means, and RBF2 denotes the model with centres from SOM. (20 marks)
(2) Design an LVQ (learning vector quantization) network for the task. (15 marks)
(3) Design an MLP (multi-layer perceptron) classifier for the task. (15 marks)
(4) Design a CNN (convolutional neural network) classifier for the task. (20 marks)
(5) Compare the best performances of RBF1, RBF2, LVQ, MLP, and CNN classifiers using confusion matrix. (10 marks)

Note:
(1) It is acceptable to follow references (or using code fragments) from textbooks or internet resources, but you must cite them clearly in your report;
(2) It is acceptable to apply Matlab toolboxes and Matlab functions.

2. Report (20 marks)

Each student must write an individual report in English. The report must be a single file in .pdf format including all the plots, figures, tables and appendixes (failure to comply with this requirement will be marked as Fail according 5. Marking Criteria).

The format of the report is: single-column A4 size, Times New Roman 12pt, single line spacing, page numbered, 0.75-inch margin on top/bottom/left/right, and with maximum 30 pages including cover page, reference (and appendixes if any).
The structure of the report is:
(1) Introduction: task description and background introduction;
(2) Methodology: introduction of the methods and models;
(3) Experimental results and analysis: experiment procedures, results discussion and analysis, performance comparison etc.;
(4) Conclusion;
(5) References.

3. Submission

You are required to:
(1) Compress your written report and source code into one single .ZIP file (other format such as .rar or .7z will be marked as Fail according to 5. Marking Criteria);
(2) Name the zip file as: StudentID_GivenName_Surname (e.g. 1701234_Rui_Yang);
(3) Upload to the submission folder in learning mall by 18:00, Friday, Jan 15 2021.

Late submission will receive penalty in the marking in accordance with the University Code of Practice on Assessment. For each working day after the deadline, 5 marks (out of 100) will be deducted for up to 5 working days. However, the mark will not be reduced below the pass mark for the assessment. Work assessed below the pass mark will not be penalized for late submission of up to 5 days. Work received more than 5 working days after the deadline will receive a mark of 0.

4. Plagiarism

This assessment is an individual work. Plagiarism (e.g. copying materials from other sources without proper acknowledgement) is a serious academic offence. Plagiarism will not be tolerated and will be dealt with in accordance with the University Code of Practice on Assessment.

5. Marking Criteria

Category	Requirement
First Class (≥70%)	Overall outstanding work. All of the requirements have been implemented in the program and report. Highly qualified report that closes to professional level. The report is well-structured and organized, with all of required information included, with very few English problems.
Second Upper (60 to 69%)	Most of the requirements have been implemented in the program and report. Good report which is clearly structured with most of the required information but with few English problems.
Second Lower (50 to 59%)	Substantial working program implementing a good range of the requirements. Acceptable written report for Year 4 level, which contains sufficient information but some English problems.
Third (40 to 49%)	Executable program that generates recognizable results, which however are incomplete. The written report is readable with insufficient information covered. Problems may appear in the structure and organization, with many English problems.
Fail (0 to 39%)	Wrong format in submission. Program is not working; or most of the required results are not produced; or without acknowledging properly sources used if any. Poor report which covers very limited number of items required.
No submission	A mark of 0 will be awarded.

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