

FIT5186 Intelligent Systems

February 2018

Assignment: Solving a Neural Network Problem

This assignment is worth **40%** of the total mark in the unit.

This assignment can be an **individual** work or a team work of **2 or 3** students.

(a) Assignment Proposal (10%) Due Date: 11:55pm Friday 27 April 2018 (Week 9)

(b) Assignment Paper (30%) Due Date: 11:55pm Friday 25 May 2018 (Week 13)

Description:

In this assignment, you will be applying what you have learnt about neural networks and the backpropagation learning algorithm to a classification, prediction or forecasting problem of your choice using a neural network software such as NeuroShell 2.

You are expected to train your network and perform some sort of analysis of the results. Perhaps you could compare the neural network results to some traditional techniques you know? Perhaps you could experiment with different parameters and architectures to see the effect they have on the results? The more analysis you do, the more insight you will gain into the problem and the technique (and the more marks you will receive).

(a) Assignment Proposal (10%)

What to submit:

When you have identified your problem, you need to write a proposal which outlines your problem, where you will get your data set, what the data set is, what the inputs and outputs will be, the neural network techniques/models you will use, and the experiments or analysis you will do.

Your assignment proposal should be around **400-800 words (2-3 pages)** and have a (tentative) **title** and is expected to include the following **4** sections:

1. **Problem** (the exact thing you try to predict or classify; a brief description of the context or motivation for the problem)
2. **Data** (where will you get your data set? what is the data set? what will be the inputs and outputs?)
3. **Method** (what neural network or other techniques/models will be used or investigated? what software or system will be used if not NeuroShell 2?)
4. **Analysis** (what kind of experiments or analysis will be conducted?)

Your assignment proposal may include a Title page with the following information: (a) the unit code and the unit name, (b) the (tentative) title of your assignment proposal, (c) your names, (d) your student ID number, (e) the University and/or the School (Faculty) you are enrolled in, (f) the date this assignment is due or submitted. This title page is not included in the word count or page limit (i.e. 400-800 words or 5-8 pages).

Online submission using Moodle:

Please upload an MS Word file containing your assignment proposal. Please name your file using your assignment group number, for example, 1_proposal.doc.

(b) Assignment Paper (30%)

What to submit:

You are required to write up your assignment work and findings in the form of a **short paper** (one-column conference-type or journal-type) with **1,500-2,500 words (5-8 pages)**. Your assignment paper should have a **title** and is expected to include the following **8** sections:

Abstract (including 3 to 5 keywords) - using no more than 150 words to summarise what the paper is about clearly and specifically, including main findings of the study.

1. **Introduction** (brief outline of your problem, review of related literature, and why neural networks are suited)
2. **Data Sets** (where do you find the data? how are you using it? e.g. inputs and outputs? preprocessing?)
3. **Training Issues** (choice of architecture, parameters, etc.)
4. **Results** (presenting results with some analysis/comparisons)
5. **Limitations** (e.g. data or conditions required; how useful are your results)
6. **Conclusion** (including your assessment of NNs for the problem – e.g. what have been achieved by using NNs for addressing the problem)

References

Please read some published papers related to your topic to get an idea of the style and format.

Your assignment paper may include a **Title page** with the following information: (a) the unit code and the unit name, (b) the title of your assignment paper, (c) your names, (d) your student ID number, (e) the University and/or the School (Faculty) you are enrolled in, (f) the date this assignment is due or submitted. This title page is not included in the word count or page limit (i.e. 1,500-2,500 words or 5-8 pages).

In addition, you are required to submit all your NeuroShell 2 files generated during your best experiment. If you use a software or system other than NeuroShell 2, you need to submit all the files used to produce the results. Your results must be able to be reproduced.

Online submission using Moodle:

Please upload a .zip file containing your assignment paper in MS Word and all your NeuroShell 2 files. Please name your .zip file using your assignment group number, for example, 1_paper.zip.