Dawson Cognitive Science Course
Scaffolded Network Project

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Final Paper:
As the major capping exercise for this course, students are required to write a 10 - 15 page research report. This paper will describe the student's work on using class software to train an artificial neural network on a topic of interest to them. It is expected that the topic of the project will be selected by the student in consultation with the instructor. Hopefully the student will be able to train a network to perform some activity of interest to them by defining the problem, training the network, and examining its structure. The network project will define and describe all of this activity.

This project is of major importance for the course, and one of my main objectives is to provide students with a positive research experience, and to provide some guidance and structure for this project. *To accomplish this, I am using a sequencing or scaffolding method for this assignment.*

With this approach, students will accomplish four different structured tasks, all of which are designed to produce a solid project when they are accomplished. Each of these tasks can be viewed as a stage in carrying out the project. A brief description of each stage is in the table below; the remainder of this document describes each of the four stages in more detail, and provides the rubrics that I will use to mark each stage. The course syllabus indicates when each stage of this sequenced project is due. The four stages together define a paper project worth 60% of the total grade for the course; the worth of each individual stage is provided in the table below as well.

Stage	Content	Worth of Total Course Grade	Highest Possible Raw Score
1	Title, Topic, Intial References	5%	5
2	Annotated Bibliography	10%	50
3	Introductory Paragraphs, Outline, Reference List	10%	70
4	Final Term Paper	25%	70
		50% Total	

Logic:
The purposes of sequencing the project are 1) to encourage students to create their project using a cumulative and progressive process and 2) to structure the project logically from picking a topic, researching the topic, creating a training set and carrying out a simulation study, and finally converting all of this into a finished paper. Students are encouraged to consult with the instructor in each stage of this project.

The following pages provide an account of what students are being asked to produce in each stage, as well as the rubrics that I will use to mark each stage.

Stage 1: Title, Topic, Initial References

The first stage of the scaffolded paper assignment is for students to begin to think about the topic for their project. Students will submit (one electronic copy, one hardcopy) a short document that includes the following three components:

1. A potential title or topic for your project
2. A brief paragraph that describes the purpose of your paper; for instance a brief account of what you want to train a network to do.
3. At least three references, in APA formats, of sources (e.g. journal articles, books) that you believe are related to your topic and which will likely be cited in your paper. For instance, these may be examples of other neural network studies related to your topic

Your Stage 1 submission will be marked as follows:

PSYCO 452 Network Project Marking Rubrics
Stage 1: Title, Topic, Initial References

Student:

Criterion	Mark			
Draft title of project has been provided	0	1		
A short paragraph describing the topic has been provided	0	1		
At least three references, in APA format, have been provided that are expected to be related to the project's topic	0	1	2	3

Total Mark: _____/5

General Comments:

Stage 2: Annotated Bibliography

The second stage of the scaffolded paper assignment is for students to begin to research their topic by finding and reading resources related to it. Students will submit (one electronic copy, one hardcopy) an annotated bibliography that results from this research phase. This bibliography will consist of 10 different references. For each reference, the student will provide the following information (e.g. in one paragraph for each reference):

1. The full APA format reference for the reference.
2. A few sentences that describe the main point or point that the reference makes.
3. A few sentences that describe the general relationship between the reference and the topic of your research project.

Note that your project topic might have changed as you have performed this research; if so let me know what your topic has become!

Your Stage 2 submission will be marked as follows:

PSYCO 452 Term Paper Marking Rubrics for Stage 2: Annotated Bibliography

Student:

Reference	Mark For Reference On Each Criterion								
	APA		Summary			Relation To Topic			Total
Reference #1	0	1	0	1	2	0	1	2	
Reference #2	0	1	0	1	2	0	1	2	
Reference #3	0	1	0	1	2	0	1	2	
Reference #4	0	1	0	1	2	0	1	2	
Reference #5	0	1	0	1	2	0	1	2	
Reference #6	0	1	0	1	2	0	1	2	
Reference #7	0	1	0	1	2	0	1	2	
Reference #8	0	1	0	1	2	0	1	2	
Reference #9	0	1	0	1	2	0	1	2	
Reference #10	0	1	0	1	2	0	1	2	

Total Mark: _____ /50

General Comments:

Stage 3: Topic, Training Set, Pilot Studies

The third stage of the network project involves defining and creating a training set, and training a network (or networks) on it using the software supplied in class. By now, you should be very confident in your choice of topic, you should understand what main points will be explored in your project, and you should understand how a little bit about what you need to train a network on your selected problem. The point of Stage 3 is to start to assemble this information in an orderly fashion to make the final stage (the final report) fairly easy to do. Students will submit (one electronic copy, one hardcopy) a document that provides the following information:

1. The title of the project.
2. The first few introductory paragraphs of the project.
3. A detailed outline of the remainder of the project, emphasizing your method and results. For instance, it should provide an account of your training set, an account of how you are training networks on the problem, and possibly pilot results. It should also include your current list of references for the paper, in APA format. This will be a draft of the bibliography for your final report.

Your Stage 3 submission will be marked according to the score sheet given on the following page:

PSYCO 452 Network Project Marking Rubrics for Stage 3: Topic, Training Set, Pilot Studies

CATEGORY	Below Standard		Acceptable		Good		Excellent	Total
Mark	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Total**
Topic and Rationale	Does not adequately convey topic. Does not describe subtopics to be reviewed..		Conveys topic, but not key question(s). Describes subtopics to be reviewed.		Conveys topic and key question(s). Clearly delineates subtopics to be reviewed.		Strong introduction of topic's key question(s), terms. Clearly delineates subtopics to be reviewed.	
Grammar & Mechanics	Mechanical errors substantially detract from the paper.		Very few mechanical errors that interfere with reading the paper.		Mechanical errors are rare and do not detract from the paper.		Perfect mechanics! Exceptional attention to mechanical details.	
	Little evidence that has been developed or explored.		A plausible training set created in a usable format.		A plausible training set has been developed, and there is evidence that alternative encodings were considered.		More than one plausible training set has been	
Pilot Training Studies	No pilot studies are reported.		Preliminary pilot studies have been conducted to choose a network architecture		Pilot studies have been conducted, and alternative architectures can be compared		Evidence of integrated relationship between development of training set and pilot studies.	
Supporting Material	Few acceptable sources supporting thesis.		Sources generally acceptable, but some notable exceptions.		Sources well selected to support paper topic.		Strong peer-reviewed research based support for topic.	
Originality	Little evidence of insightful and independent thinking.		Some evidence of insightful and independent thinking.		Solid evidence of insightful and independent thinking.		Strong evidence of insightful and independent thinking.	
Overall Effort	Well below average effort as indicated by detail of introduction, outline, and references.		Below average effort as indicated by detail of introduction, outline, and references.		Above average effort as indicated by detail of introduction, outline, and references..		Well above average effort as indicated by detail of introduction, outline, and references.	

Total Mark: _____/49 (Comments will be found on the hardcopy of the submitted material)**

Stage 4: Final Report

The fourth and final stage of network project is for students to write the final report itself. With all of the work that has been done, and marked, in the first three stages I am hopeful that this final stage will not be too stressful. It really involves converting the Stage 3 outline into full prose. Students will turn in both an electronic copy and a hardcopy of their project. The term paper will be marked using the scoring scheme that is provided on the following page:

PSYCO 452 Network Project Marking Rubrics for Stage 4: Final Report for Student:

CATEGORY	Below Standard		Acceptable		Good		Excellent	Total
Mark	1	2	3	4	5	6	7	**Total**
Introduction	Does not adequately convey topic. Does not describe subtopics to be reviewed..	-	Conveys topic, but not key question(s). Describes subtopics to be reviewed.	-	Conveys topic and key question(s). Clearly delineates subtopics to be reviewed.	-	Strong introduction of key question(s), terms. Clearly delineates subtopics	
Organization	Little evidence that material is logically organized. Subsections not evident.	-	Most material is logically organized, with some exceptions. Subsections used appropriately.	-	All material is logically organized. Subsections and paragraph topic structure evident.	-	All material is strongly and logically organized.	
Supporting Material	Few acceptable sources supporting thesis.	-	Sources generally acceptable, but some notable exceptions.	-	Sources well selected to support paper topic.	-	Strong peer-reviewed research based support for topic.	
Method	Poor description of training set, network, and training	-	Acceptable description of training set, network, and training.	-	Good account of training set, network, and training – coherent and replicable	-	Journal quality account of training set, network, and training	
Grammar & Mechanics	Mechanical errors substantially detract from the paper.	-	Very few mechanical errors that interfere with reading the paper.	-	Mechanical errors are rare and do not detract from the paper.	-	Perfect mechanics! Exceptional attention to mechanical details.	
Originality	Little evidence of insightful and independent thinking.	-	Some evidence of insightful and independent thinking.	-	Solid evidence of insightful and independent thinking.	-	Strong evidence of insightful and independent thinking.	
Discussion	Little evidence of relationship between network training and project topic.	-	Acceptable effort to trained network to topic.	-	Above average effort to trained network to topic.	-	Journal quality interpretation of trained network, insight into topic	
Conclusion	Does not adequately summarize main thrust of project or relate summary to introduction	-	Adequate summary of main thrust of project but no relation back to introduction	-	Summarizes main thrust of project and relates back to introduction	-	Insightful summary of project and deep relationship back to introduction	
Sophistication	Poor technical adequacy and grasp of subject	-	Adequate but not deep technical adequacy and grasp of subject	-	Solid technical adequacy and grasp of subject	-	Deep and insightful technical adequacy and grasp of subject	
Overall Effort	Well below average effort as indicated by detail of introduction, outline, and references.	-	Below average effort as indicated by detail of introduction, outline, and references.	-	Above average effort as indicated by detail of introduction, outline, and references..	-	Well above average effort as indicated by detail of introduction, outline, and references.	

Total Mark: _____/70 (Comments will be found on the hardcopy of the submitted material)