

Assignment 2. Complex Systems Project

Tasks

Do a complex systems related project.

- a. Proposal and literature review (10%). Due week 8: 1pm 11th September 2006.
- b. Project report (40%). Due week 13: 1pm 23rd October 2006.

Aims and marking criteria

- Assignment 2 provides an opportunity for you to develop your research skills in complex systems analysis, apply tools to a complex problem and/or gain experience in a practical application.
- The major criterion for assessment is the way the complex systems issues are defined, the methods are implemented and the results presented and discussed. That is, the conduct of the research itself and the application of complex systems ideas, as presented in the final report (see the marking criteria below).
- You should start by implementing the simplest possible prototype experiment and ensure that it works well before proceeding with more complex designs. (Many refinements that could-have-been-added-but-weren't can form a nice paragraph in the final report.)
- Note that no marks will be given for programming aspects such as new libraries or GUI interfaces. They may of course be included, but only spend time on these aspects if they directly improve the research outcomes, since only the research outcomes will be considered in the marking.

Submission

- Submission will be via the online submission system facility at <http://submit.itee.uq.edu.au/select.php?coursecode=COMP4006>. Assignments may be submitted multiple times, but only the last one will be marked.
 - Late submissions should also be submitted to the online submission system. Managing both your time and ability to complete a research project is part of the learning experience for the course. Extensions without penalty of up to 3 days will be given if requested by email at least 24 hours in advance. Except in the case of lecturer-approved extensions, late submissions will be penalised 10% of the possible marks per day, and submissions more than 5 days late will not be graded.
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Asgt 2a Project Proposal (10%) Due week 8

Write a proposal that clearly communicates the project you wish to conduct and the relevant background ideas

(i) Preparation: Select a general topic area and find appropriate references.

- Choose a project area (possible topic areas are linked to the course web page <http://www.itee.uq.edu.au/~comp4006/projects.html>)
- Find 2-5 relevant articles and select a potential software package or programming language
- Choose a referencing format (e.g. APA, IEEE, or another journal standard) and method (eg endnote or bibtex)
- Check that you understand the difference between good referencing and plagiarism (see section 6.1 of the course profiles http://study.itee.uq.edu.au/profiles/2006_2_COMP4006_StLucia)
- By Wednesday of week 7 add your name and topic to the wiki at http://www.itee.uq.edu.au/~comp4809/wiki/index.php/Complex_Systems_Comp4006_and_Comp7011

(ii) The project proposal:

- Do sufficient background research to plan your project in detail.
- Refine your title and reference list.
- Analyze the issues to be explored (for example, using the 4 steps in Swales technique http://www.itee.uq.edu.au/~comp4809/wiki/index.php/Defining_the_thesis_theme)
- Write your project proposal and submit it to the online system

The project proposal should contain the following information:

1. Working title and author (you)
2. Acknowledgements: list the people who have helped you develop the project proposal, such as domain specialists, or people who have read drafts of the proposal and given you feedback on the content or writing skills. Such feedback is encouraged as part of the project, but must be acknowledged.
3. Introduction following Swales outline
 - a. State the context of the research. (approx 2 sentences)
The first sentence should indicate the area and type of research to follow. Why is this area of interest?
 - b. Review the literature – what is generally known and what has been done before on the topic. (1-2 pages)
Include a reference section in conventional format at the end of the proposal.
 - c. Outline the gap in the literature to date. (approx 2 sentences)
Discuss the various approaches that could be followed, and why you have suggested to one(s) you will follow.
 - d. Overview the plan. (approx 2 sentences)
The amount of detail required in this section may vary substantially across projects. The most important part of the introduction is ensuring that the problem is stated clearly and simply. The second most important part is a clear statement of the goal of the project.
4. Methodology: Complex systems methods that you will use, such as cellular automata or networks, and algorithms, or other approach. (approx 2 pages)
Specify the design you intend to use, including
 - a. the architecture: give as much detail as possible and include a diagram (eg if using graphs, specify the number of nodes and connection structure)

- b. aspects of structure, dynamics, and/or function to be investigated
- c. for any equations used, define all terms and give appropriate citations for their source;
- d. initial parameter table (if relevant), parameter choices or ranges and their justification
- e. Describe and give examples of any data used
- f. source of data (if relevant)
- g. full details of the paradigm you intend to use
- h. results to be collected
- i. Discussion of analysis possibilities (why these results?)

Include enough detail that others may repeat your study and verify your results.

Include rationale for each of the design decisions made.

5. Implementation Details (approx 1 page)
 - a. Specify the language or simulator, the facilities you intend to use, how you will obtain or generate the data (if relevant).
 - b. Describe what measures relating to structure, dynamics and function you will collect
 - c. Describe a plan for the analysis stage: describe how the data will be collated, reported and analysed.
6. Reference list. Include all references referred to in the introduction. Don't include references not used (this is a reference list, not an annotated bibliography).
7. Work Plan and timeline (week by week to the end of the project set out as a table)
Divide the work into successive stages and outline your objectives for completing each stage. Clearly specify the prototype model and the order of implementing subsequent enhancements.
8. Style, grammar and spelling
Use appropriate terminology, without jargon. Strive for clear and simple descriptions. Check the grammar and spelling are correct.

Asgt 2b. Project report (40%). Due week 12

Tasks:

- Follow your research plan, revising and updating as seems sensible.
- You will need to monitor your own progress, but will be able to seek guidance from the lecturers during their office hours.
- The final report should contain updated versions of sections 1-5 of the project proposal, and sections on:
 - Results
 - Analyses
 - Discussion and conclusions
 - Further work (usually not more than 1-2 paragraphs)

Asgt 2a Assessment: Complex Systems Project Proposals Marking Scheme (10%)

Poor Satisfactory Good Excellent

1. Working title and author (you)
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3. Introduction following Swales outline
 - a. State the context of the research. (approx 2 sentences) The first sentence should indicate the area and type of research to follow. Why is this area of interest?
 - b. Review the literature – what is generally known and what has been done before on the topic. (1-2 pages) Include a reference section in conventional format at the end of the proposal.
 - c. Outline the gap in the literature to date. (approx 2 sentences) Discuss the various approaches that could be followed, and why you have suggested to one(s) you will follow.
 - d. Overview the plan. (approx 2 sentences)
The amount of detail required in this section may vary substantially across projects. The most important part of the introduction is ensuring that the problem is stated clearly and simply. The second most important part is a clear statement of the goal of the project.
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 - e. Describe and give examples of any data used
 - f. source of data (if relevant)
 - g. full details of the paradigm you intend to use
 - h. results to be collected
 - i. Discussion of analysis possibilities (why these results?)
Include enough detail that others may repeat your study and verify your results.
Include rationale for each of the design decisions made.
5. Implementation Details (approx 1 page)
 - a. Specify the language or simulator, the facilities you intend to use, how you will obtain or generate the data (if relevant).
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8. Style, grammar and spelling
Use appropriate terminology, without jargon. Strive for clear and simple descriptions. Check the grammar and spelling are correct.

FORM

Written quality of project

logical flow of ideas; clear and concise descriptions; appropriate use of professional terms and style; complete and consistent references; grammar, spelling, typing; separation of technical material from discussion

OVERALL IMPRESSION

Assignment 2b Assessment

Final Project Report Marking Scheme (40%)

Poor Satisfactory Good Excellent

GENERAL

Balance of effort
intro; background to the research; design of the study; simulation details; results and analyses; discussion and conclusions; polishing report; all to comparable standard

Research initiative
difficulty of simulations, initiative in ideas, analyses, discussion, contribution of project identified

CONTENT

Introduction
title; issue identified and introduced (description of context; avenues explored; integration of background literature; identification of gap and specific question; intro to present; extent of understanding demonstrated

Design of experimental series
does the series address the issue; suitable size; clear identification of simulation aspects to vary; measures and analyses identified; justification for all design aspects

Simulation details
implementation - completeness and correctness of model; all terms defined; table of parameters used; diagram of system; description and examples of data; sufficient detail for replication

Results and Analyses
succinct and clear presentation of results; tables and graphs if necessary; separation of simulation method from results, and results from discussion of their relevance; appropriate choice of analyses; clear presentation of analyses; discussion of each experiment in sequence

Discussion(s) of each experiment in series
critical comment on the results of simulations, drawing out of implications, and assessment of the findings; discussion of any problems encountered

General Discussion and Conclusions
discussion of the relevance of the results to the issues identified in the introduction, clear statement of conclusions, novelty/contribution of the project identified

Acknowledgements
include a statement of the degree to which the work is your own, and outline any assistance received

Appendix (if necessary)

FORM

Written quality of project
logical flow of ideas; clear and concise descriptions; appropriate use of professional terms and style; complete and consistent references; grammar, spelling, typing; separation of technical material from discussion

OVERALL IMPRESSION

Total