COS700 RM – Research Methods 2015

Lecture 1

What is research?

The topic and the problem statement.
How things will work

• There will be 7 contact sessions on every second Wednesday 16h30 – 18h30:
  – 4 Feb, 18 Feb, 4 March, 18 March, 15 April, 6 May, 20 May.

• Study material:
  – There is no prescribed book.
  – References will be given to recommended material as topics are covered.
  – Required reading will be published on the COS700 website.

• Topics to help you to do a good research project.

• Assessment:
  – You will be required to hand in a full research proposal for your Honours project.
  – Marks will be awarded for the quality of the research proposal as well as the quality of your peer review of other research proposals.
  – We will be using a proper peer review system as part of this process.
Some preliminary questions for discussion

- What are you hoping to achieve through your research project?
- How many people do you expect will read your research report?
- Who should you be writing for?
- How important is it for you to do well in your project?
- What is your plan for fitting in time for your research project?
- How are you progressing with finding a topic?
Academic Research

• What is research?
  – Research is a systematic investigation to discover facts.
  – The purpose of research is to come to new knowledge.

• What is not research:
  – A software development project.
  – Writing a text book.

• Framework of questions for driving the process of research:
  – What do you want to investigate?
  – Where will the data come from?
  – What will you do with the data?
  – How will you know if you have achieved your goal?
  – How will you report your results?
The research topic vs. the problem

• The research topic:
  – The subject of the research project.
  – A good topic is focussed: Within a discipline, there is an area of interest. Within the area of interest, you will be concentrating on one aspect and within that you focus your topic.

• The topic is not the research problem:
  – Why is this topic being researched?
  – What will be investigated within the topic of the research?

1. Field / Discipline
   Computer Science

2. Area of interest
   Computational Intelligence

3. Concentration
   Particle swarm optimisation

4. Focus
   Carry trade portfolio optimisation

THE TOPIC
   Carry trade portfolio optimisation using PSO
Group Exercise

• You have been given the front pages of a number of research papers.
• For each of these papers,
  – identify the field, area of interest and concentration area.
  – Formulate a problem statement that is a motivation for the research.
Choosing a research topic

- Can you identify a clear problem within the topic?
- Is the topic focussed or broad? (broad = more difficult)
- Can you easily find existing literature on the topic?
- Do you have a clear idea of what you will do (what is the method of investigation)?
- Is there good supervisor support?
- Does the topic match your interests?
References


• “Research Methods in Computing: What are they, and how should we teach them?”, H.J. Holz, A. Aplin, B. Haberman, D. Joyce, H. Purchase, C. Reed, ITiCSE 2006, Bologna, Italy.